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REVIEW OF SECTORAL CLUSTERS, FIRST PHASE: HEALTH, HUMAN SETTLEMENTS AND FRESHWATER

Freshwater resources

Report of the Secretary-General

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INTRODUCTION

1. In decision 1993/314, the Economic and Social Council approved the provisional agenda for the second session of the Commission on Sustainable Development which, in item 6 (a), provided for a review of sectoral clusters, first phase: health, human settlements and freshwater.

2. In thematic reports such as this, corresponding to the Agenda 21 sectoral clusters, the Commission requested the Secretary-General to include information on the main activities that countries were undertaking or planning (E/1993/25/Add.1, chap. I, para. 28). In order to give the Secretariat sufficient time to analyse the information received, the Commission urged Governments to submit their reports not less than six months prior to the Commission's sessions (E/1993/25/Add.1, chap. I, para. 24). Unfortunately, the Secretariat had received only a few national reports at the time of the preparation of the present report, which is therefore based mostly on information available within the United Nations system.

I. GENERAL OVERVIEW

3. The world population, which in 1990 totalled 5.3 billion people, is expected to increase by approximately 1 billion by the year 2000, with about 93 per cent of the increase taking place in developing countries, particularly in Africa and Asia. Twenty countries with a total population of 131 million people were already in a condition of scarcity in 1990 and another eight countries, with a total population of 203 million were under stress, based on a definition of water scarcity as a per capita availability of freshwater resources of 1,000 cubic metres or less, and of water-stressed as a per capita availability of between 1,000 and 17,000 cubic metres. By the year 2010, 26 countries, with a total population of 416 million, will be under scarcity conditions, and 12, with a total population of 407 million, will be under stress. By the year 2025, a full 35 per cent of the world population will be living under conditions of scarcity or stress, compared with about 6 per cent in 1990. 1/ Already, many countries suffer from water scarcity in some areas, even though on the average they are deemed to have plentiful water resources. In 1987, the World Commission on Environment and Development concluded that some 80 countries, with 40 per cent of the world population, were already suffering from serious water shortages. 2/

4. The availability of freshwater is further affected as a result of serious deterioration of its quality. Most of the sources of pollution that have severely affected the industrialized countries are also present in the developing world and there are few parts of the world that are still exempt from problems of degraded water quality and pollution of surface water and groundwater sources. The waste-assimilative capacity of freshwater bodies adjacent to towns in many developing countries has often been outstripped. There is also increasing concern about the entry of fertilizers and pesticides into surface and ground waters.

5. The rapid growth of urban centres brings with it increased demands for domestic, municipal and industrial uses. Increased levels of population also generate a demand for more food production, with its implications for intensified cropping and increased competition and conflicts among various land and water uses. An estimated 110 million hectares of land with agricultural potential in all developing countries, excluding China, will need to be claimed for human settlements and agricultural use by the year 2010. 3/ While these requirements appear to be small when compared with 1.8 million hectares of land with agricultural potential not occupied by either of these two uses, "land scarcities are very acute in some countries and regions, namely South Asia and Near East/North Africa. Even the small increases foreseen for them are a significant part of their still unused land. 3/ It is further expected that problems related to food production will be exacerbated by a degradation of existing irrigation systems to the point that they have to go out of use. Degradation of soils is estimated to affect some 1.2 billion hectares of land worldwide, of which 450 million are in Asia, 320 million are in Africa, 227 million are on the American continent and 158 million are in Europe. Deforestation and overgrazing are each estimated to account for about one third of the total area affected, while the bulk of the remaining affected area has been caused by mismanagement of arable land. 3/

6. Constraints vis-à-vis the availability of water for agriculture will be even more severe than land constraints. Irrigated agriculture will increasingly have to compete with higher-value uses and, at the same time, it will be expected to produce much more with less water. An estimated 80 per cent of the additional food supplies required to feed the world in the next 30 years will depend on irrigation. 4/

7. Over-extraction of groundwater, while most acute in the Near East, is a growing problem in other areas, including large areas of South Asia, where food is heavily dependent on irrigation. "Overpumping in these areas is causing water levels to fall beyond the reach of shallow tubewells, with the risk that irrigation may eventually become too expensive or physically impractical." 4/

8. Floods continue to exact an increasing toll in life and damages, particularly in the many developing countries that lack forecasting and warning systems. At the other extreme, droughts plague large parts of Africa, Asia and Latin America, killing many people and disrupting development.

9. While in the past there was a tendency to regard water problems as being local or regional in nature, there is a growing recognition that their increasingly widespread occurrence is quickly adding up to a crisis of global magnitude. Water scarcity relative to demand is no longer a problem in arid or semi-arid areas alone, but is now a common occurrence in both developed and developing countries.

10. For a large part of the world, the issue of sustainable land and water resources development is intimately related to the issue of poverty. To the very poor, who may barely eke out a living in rural or peri-urban areas, concerns about degradation of the environment will take a back seat to concerns of day-to-day survival. The modern sector and mass poverty coexist in the vast majority of developing countries. Both bring with them obstacles to the

sustainable development of land and water resources. In poorer countries, the temptation exists to mortgage the future by engaging in development projects that may bring short-term economic benefits but are not sustainable in the long run. While in some cases damage done to the environment might be reversible, it may only be remedied at exceedingly high social and economic costs, or not at all. Without a concerted effort to deal with economic growth, poverty and a more equitable distribution of income, developing countries will not be able to cope with issues related to the long-term sustainability of land and water development.

II. REVIEW OF PROGRESS ACHIEVED IN THE PROGRAMME AREAS OF CHAPTER 18 OF AGENDA 21 AND INTERNATIONAL COOPERATION

11. In chapter 18 of Agenda 21 (Protection of the quality and supply of freshwater resources: application of integrated approaches to the development, management and use of water resources), 5/ the United Nations Conference on Environment and Development (UNCED) emphasized the importance of water resources in all aspects of life, and that the general objective was to make certain that adequate supplies of water of good quality were maintained for the entire population of the planet, while preserving the hydrological, biological and chemical functions of ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water-related diseases. Chapter 18 stresses the multisectoral nature of water resources development in the context of socio-economic development, as well as the multi-interest utilization of water resources for water supply and sanitation, agriculture, industry, urban development, hydropower generation, inland fisheries, transportation, recreation, low and flat lands management and other activities.

12. In chapter 18 of Agenda 21, the Conference approved seven programme areas for action at the national and international levels: (a) integrated water resources development and management; (b) water resources assessment; (c) protection of water resources, water quality and aquatic ecosystems; (d) drinking-water supply and sanitation; (e) water and sustainable urban development; (f) water for sustainable food production and rural development; and (g) impacts of climate change on water resources. The present section provides information on progress and issues concerning the implementation of recommendations contained in these seven programme areas; the programme areas on water resources assessment and impacts of climate change are discussed together. Unfortunately, only a small number of reports have been submitted by Governments on the implementation of the programmes in chapter 18. These have been used together with information available to the organizations of the United Nations system. The present section also describes the activities of the organizations of the system in the implementation of the programmes, based on a task manager report prepared through the Subcommittee on Water Resources of the Administrative Committee on Coordination (ACC).

A. Integrated water resources development and management

13. Modern water legislation has considerably broadened the type and scope of issues to be considered in the regulation of water resources. In particular, there is a clear trend to link water legislation to economic and environmental issues, with a strong focus on quality aspects and pollution control, and concern with integrated and efficient water resources planning, with emphasis on river basin and regional planning. Water planning is being coordinated with planning for other natural resources and economic and social objectives. More concern is being shown with the development of appropriate information and guidance for policy makers, administrators, users, purveyors of water services and the public at large, and with the inclusion of provisions for public participation. 6/

14. Nevertheless, the management of water resources in developing countries remains generally fragmented. In the light of the serious economic and political problems being faced in Africa, little if any significant success is evident in this regard, and the fragmentation of institutional responsibilities hinders the formulation of holistic approaches for the integrated development of water resources.

15. The most recent survey conducted by the Economic and Social Commission for Asia and the Pacific concerning the implementation of the Mar del Plata Action Plan 7/ was completed in May 1991. The countries responding to the survey indicated that considerable progress had been made by countries in the region towards the formulation of national water policies and comprehensive master plans. Nevertheless, the majority of the respondents felt that their existing regulations were not sufficient or were incompatible with existing development plans. Although floods are a major concern to the majority of the countries in the region, most of them have no adequate structural or non-structural measures.

16. Water management in Latin America remains far from optimum, despite the progress made in the application of scientific management techniques. This is especially the case in regions where the use of the resource of water is most intensive and conflictive. Many issues inherent to water system operation are being poorly handled and even ignored. This is the case, almost without exception, with respect to the maintenance of infrastructure. There is some evidence, however, that the establishment of a clear distinction between responsibility for the management of the resource and responsibility for the management of its use can be beneficial. Private sector or user participation in management can be a valuable tool towards achieving that distinction.

17. Water legislation in Western Asia is deemed to be generally complex and outdated with regard to modern management practices and techniques, and has resulted in the fragmentation of administrative responsibilities. Provisions which regulate water resources development and management are often contained in different laws and regulations, or have originated from traditional and customary uses which relate to the prevailing social structure of some member countries. A number of countries, including Jordan, the Syrian Arab Republic, Iraq and the Gulf States, have recently carried out critical examinations of their legislative structures. 8/

18. As far as Europe is concerned, the Convention on the Protection and Use of Transboundary Watercourses and International Lakes has been signed by 25 countries and the European Community, and ratified so far by Albania, Norway, the Republic of Moldova, the Russian Federation and Sweden. Issues regarding the prevention of, preparedness for, and response to industrial accidents, in particular those with accidental pollution of transboundary waters, are covered in the 1992 Convention on Transboundary Effects of Industrial Accidents.

19. With regard to the organizations of the United Nations system, through the ACC Subcommittee on Water Resources, they are engaged in the process of formulating strategies for accelerating progress in the area of integrated water resources development and management. Work in this regard has been initiated with the Department for Development Support and Management Services of the United Nations Secretariat, the World Bank, the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP) as lead agencies.

20. A capacity-building approach defined by UNDP in 1991 was further refined at the International Conference on Water and the Environment (Dublin, January 1992) and at the United Nations Conference on Environment and Development (Rio de Janeiro, June 1992), a series of water sector assessments in developing countries were carried out by the Department for Development Support and Management Services in cooperation with the World Bank. The latter engaged in a revision of its policies and published a policy paper in 1993. 9/ In view of the fact that the largest proportion of freshwater is used for agricultural production, the Food and Agricultural Organization (FAO) formulated water policy guidelines related to agriculture, and included a chapter on water policies and agriculture in its recent publication, The State of Food and Agriculture, 1993.

21. The Department for Development Support and Management Services, together with UNDP, has carried out a number of pilot sector assessments or diagnostic studies in such countries as Bolivia, India, Morocco, Nepal, Peru and Yemen. Further work is envisaged in China, Madagascar, Papua New Guinea and the countries of the Southern African Development Community. The approach has been found to be most useful in formulating UNDP country programmes in the context of national development plans and priorities, particularly in the context of capacity-building.

22. Another initiative in this area concerns the collaboration of the Department for Development Support and Management Services and UNEP, with the close support of UNDP and the World Bank, in launching the Freshwater Consultative Forum. One of the important conclusions of the first meeting of the Forum, which was convened from 13 to 16 December 1993, was that UNEP and UNDP should choose an existing river or lake basin organization with a critical need, where the various recommendations for improving water resources management could be applied.

23. UNEP is continuing to refine and apply its comprehensive, multi-disciplinary approach to integrated management of freshwater resources. It also works to assist Governments to integrate fully the environmentally sound management of natural resources into national plans for social and economic development. To date, UNEP activities in this area have been completed for the

international drainage basins of the Zambezi River, Lake Chad, the Aral Sea and Lake Titicaca. Activities are in the planning or consultative stage for the Nile, Mekong, Orinoco, Catatumbo and San Juan rivers, the Caspian Sea and selected island States.

24. One of the three key areas of concentration of the Institute on Natural Resources in Africa of the United Nations University (UNU/INRA, Accra, Ghana) relates to soil and water conservation for environmental management in Africa. Even though it is clear that women have an important role to play in the management of water resources, this important dimension has mostly been neglected in the past. In this regard, the International Research and Training Institute for the Advancement of Women (INSTRAW) has been instrumental in bringing to the fore the need for the greater involvement of women in the development and management process.

25. The Economic Commission for Africa (ECA), in collaboration with the Organization of African Unity, finalized a Protocol in Natural Resources including Water Resources Development in Africa. In 1993, the ECA prepared a comprehensive study on problems, prospects and strategies for cooperation among riparian countries for the integrated water resources development of the Nile River basin, and published a detailed study on the conservation and rational use of water resources in six North African countries. The Economic Commission for Europe (ECE) was instrumental in the development and adoption of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. ECE has also prepared a review of national strategies and policies for the protection and use of transboundary waters, and has drawn up a consolidated list of bilateral and multilateral agreements and other arrangements in Europe and North America on these issues. Work is also being pursued on the development of instruments to promote sustainable water management. The Economic Commission for Latin America and the Caribbean (ECLAC) has prepared a number of reports on the subject of integrated water resources management, and acts as the secretariat of the Latin American and Caribbean Network for Integrated Water Management, which consists of institutions dealing with this question. It also organizes courses on water resources management in various countries of the region. ECLAC, jointly with UNEP, has organized a workshop to discuss the follow-up in the regions of the recommendations of chapter 18 of Agenda 21 with regard to water management policies in Latin America and the Caribbean. In 1991, ESCAP organized a regional Workshop on Sustainable Development and Environmentally Sound Development of Water Resources, and prepared papers on an integrated approach to the efficient development, management and use of water resources. The Economic and Social Commission for Western Asia (ESCWA) convened a Symposium on Water Use and Conservation in November 1993.

B. Water resources assessment and impacts of climate change on water resources

26. Regional assessments carried out in 1990 by the World Meteorological Organization (WMO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) with regard to the implementation of the Mar del Plata Action Plan during the 1980s indicated that in the late 1970s there was evidence that countries were developing and strengthening their water resources

assessment programmes. However, the trend suffered a reversal in the mid-1980s under pressure of economic stringency. The survey gave cause for concern that, at a time when greater demands were being made for more precise information about the availability, variability and reliability and quality of water resources data, data collection and analysis had fallen behind water development and management needs. 10/

27. The modest increases that were achieved in Africa during the early 1980s later gave way to a deterioration in equipment and its operation owing to a lack of funds and trained staff. The situation in the ESCWA region and in countries north of the Sahara was found to be similar to that of Sub-Sahara Africa. A general deterioration of operation and maintenance and database management procedures were found to be problems in these regions. The survey found that good progress had been made in the ESCAP region with regard to the collection of project-oriented water data, in establishing computerized databanks and in preparing generalized water resources information. Problems of coordination among a diversity of agencies dealing with water resources assessment were found to exist, and the operation and maintenance of the diversity of equipment used was a cause for concern. Overall coverage of hydrometeorological and surface networks in the ECLAC region was deemed to be fairly well matched to development needs. However, few attempts were made towards the integration of data into a resource management system. Within the ECE region networks were found to be comparatively well established, with the exception of large parts of northern Canada, northern Scandinavia and the former USSR, which had only rudimentary services in place. Many different assessment and interpretative techniques, as well as modern hydrometric technology and database management techniques, are routinely applied.

28. Since the completion of the survey, there has been little evidence to indicate that major positive changes have taken place or that progress has been achieved. The situation in Africa continues to be critical. The World Bank project aimed at evaluating the status of existing water resources assessment capabilities of the sub-Saharan countries concluded that, "few countries now have services which can be compared favourably with those existing 10 and 20 years ago. No country has a service which is adequate as a basis for sustaining the many water developments which can be expected in the region in the coming decades". 11/ The study goes on to conclude that, "manpower is rarely sufficient to allow data collection agencies to meet their obligations, with establishments being too small and manpower skills insufficient for the workload". 11/ Latin America and the Caribbean, as well as Asia and the Pacific, continue to face considerable problems. In addition, conditions in Eastern Europe and the successor States of the former USSR have recently worsened to the extent that many countries in Eastern Europe and Central Asia have suffered serious reductions in their hydrological services.

29. In order to coordinate their programmes better, UNESCO, together with WMO and the International Council of Scientific Unions (ICSU), convened an International Conference on Hydrology (Paris, 22-26 March 1993). The Conference agreed on the Paris Statement with five recommendations, including one to achieve even closer partnership between the two agency programmes at the national and international levels. One expression of the partnership between UNESCO and WMO is the publication, in 1988, of the first edition of the

UNESCO/WMO Water Resource Assessment Activities: Handbook for National Evaluation, which allows national bodies to assess their capabilities in water resources assessment. The second edition will place greater emphasis on water quality, grourdwater and other aspects of water resources assessment not dealt with adequately in the first edition. Within its International Hydrological Programme (IHP), UNESCO is developing a hydrological research programme aimed at the appropriate assessment of the available water resources of the world in order to meet the needs for water supply, agriculture and industry.

30. Transfer of hydrological technology through the ongoing WMO technology transfer system, known as the Hydrological Operational Multipurpose System (HOMS), has continued. Many of the components deal with water resources assessment, but some, such as those for the design of flood forecasting systems, are relevant to disaster mitigation and the International Decade for Natural Disaster Reduction. Since HOMS commenced in 1981, nearly 3,000 transfers of technology have been undertaken, the majority from North to South, but some North-North and some South-South.

31. The Department for Development Support and Management Services and WMO have participated in the activities of the Steering Committee of the World Bank/UNDP project on Sub-Saharan Hydrological Assessment in Africa, jointly financed by UNDP, the World Bank, the African Development Bank, the European Community and French bilateral contributions. The aim of the project is to diagnose the gaps in the hydrological and hydrogeological monitoring networks and to assess the institutional capabilities of hydrological and similar agencies in the region.

32. WMO continues its efforts in disaster mitigation relating to floods, avalanches, landslides and droughts. Efforts are also being made to promote the use of weather radar for hydrological forecasting and warning, particularly within Europe. WMO has established two drought monitoring centres in Africa, one at Nairobi and the other at Harare. Its involvement in the planning for the International Decade for Natural Disaster Reduction has led to several projects being undertaken especially for the Decade.

33. Water-related natural disaster reduction activities have been carried out by ESCAP with the aim of strengthening the disaster preparedness and mitigation capabilities of member countries. In 1993, ESCAP conducted roving seminars on comprehensive flood loss prevention and management in Myanmar, Pakistan, the Islamic Republic of Iran and Solomon Islands. ECLAC, with the cooperation of the Government of Italy, has prepared a manual on disaster preparedness to assist countries in the region to deal with water-related natural disasters.

34. While uncertainty remains about the future climate on a global, regional or smaller scale, there is no uncertainty that water resources will change more drastically as a result of climate change than any other sector, and that these effects will in turn have an impact on other sectors. Higher temperatures worldwide and the higher evaporation rates they will bring, if coupled with lower precipitation, would lead to a reduction in world water resources. However, in some regions precipitation may increase, and higher atmospheric carbon dioxide concentrations may increase the water-use efficiency of many plants, especially in drier regions.

35. These changes are likely to be exacerbated where sealevel rise poses a threat to low-lying areas, particularly in the case of small islands. In this regard, it is expected that sealevel rise would endanger coastal groundwater resources through saline intrusion, especially in small islands where the recharge area would be reduced. Changes in rainfall amount, duration and seasonal distribution may adversely affect groundwater recharge and rainwater harvesting for small islands. Increases in the frequency and severity of tropical cyclones, hurricanes and typhoons may result from higher sea surface temperatures, with a consequent increase in storm damage and flooding reinforced by sealevel rise.

36. The proposed World Hydrological Cycle Observing System (WHYCOS) (see para. 72 below) will offer the opportunity to overcome some of these problems, particularly on a global scale. However, a more detailed project, which concentrates on the hydrological regime of several sets of small islands situated in different climatic regimes is needed. WMO has been involved in initial proposals for such a project and, together with UNEP, WHO and UNESCO, it also convened a Workshop in Trinidad and Tobago from 5 to 9 July 1993, which dealt with water quality issues in small islands.

37. Through the World Climate Programme-Water (WCP-Water), WMO, UNESCO, UNEP and FAO, with the participation of non-governmental organizations, national institutes and bodies, address the problem of climate change and water resources. In a related initiative, FAO, ICSU, UNEP, UNESCO and WMO are cooperating in the planning phase for a Global Terrestrial Observing System (GTOS) on longer-term changes in natural and agro-ecosystems, including hydrological features.

38. ECLAC, in November 1993, convened a regional expert meeting on the possible effects of climate change on water resources in Latin America and the Caribbean. ESCAP formulated a project on potential effects of climate change on water resources and related economic activities.

C. Protection of water resources, water quality and aquatic ecosystems

39. The 1990 WHO/UNEP assessment of progress in the implementation of the Mar del Plata Action Plan with regard to water quality concluded that most of the sources of pollution that have severely affected the industrialized countries are also present in the developing world, whereas measures for preventing or at least limiting the degradation of water quality, and even for the assessment of its scale and trends, are not generally applied. Furthermore, the ever-increasing population pressure and, more worrying, the rapid growth of urbanization are causing a dangerous concentration and acceleration of pollution and the deterioration of water quality in surface and groundwaters. 12/

40. Bacteriological pollution, organic wastes, suspended solids, organic micro-pollutants, nitrates, eutrophication and salinization were ranked as the major pollution issues in developing countries, in decreasing order of severity.

41. In the Latin America region, one of the main causes of water pollution is the direct discharge of domestic sewage and industrial effluent into watercourses. There is a lack of wastewater treatment plants for any but the most toxic industrial wastes. Virtually all municipal sewage and industrial effluent is discharged into the nearest rivers and streams without any treatment. Agriculture through irrigation has given rise to high salinity affecting soils, surface waters and groundwater, and through the use of fertilizers and pesticides has caused the eutrophication of water bodies and levels of chemical residues dangerous to human life and aquatic biota.

42. The reports on both East and West Africa express very similar concerns, with emphasis on bacteriological content, organic waste loading, suspended solids and nitrates as major pollutants, and with the threat of increased problems from intensified agriculture and the associated expansion of fertilizer and pesticide use. Many of the shallow groundwater resources appear to be becoming contaminated by pathogenic agents, largely from domestic sources, but there is little systematic water quality monitoring to assess such trends in most of the countries studied.

43. The major aspect of water quality in the Western Asia region is that of salinity, associated closely with the large proportion of water used for irrigated agriculture, and thus the heavy demands mainly on groundwater sources. The lack of detailed information on water quality in this region appears to lie in a general absence of monitoring, which may be obscuring the presence of problems or trends towards their development.

44. The Asia and Pacific region presents problems similar to those of the other regions but, with its large and highly concentrated populations in the major countries, their scale is magnified accordingly. Sedimentation is proving damaging and costly to control in many river basins, arising from improper land management practices in upper catchments, where the pressure of growing populations exceeds the capacity of available, suitable agricultural land.

45. With regard to the activities of the organizations of the United Nations system, UNEP is co-sponsoring a number of programmes which relate directly to water quality protection. One is the Global Freshwater Quality Monitoring Programme (GEMS/WATER), the other is the International Union for Conservation of Nature and Natural Resources (IUCN), which deals with ecological aspects of water resources. Linkage with health protection objectives is maintained by WHO through the GEMS/WATER programme of UNEP, and also through its work on water pollution control. FAO is linking up through its recently established interdepartmental working group on pollution of natural resources. The disease control and eradication programmes of WHO, notably diarrhoeal diseases, guinea worm, schistosomiasis and river blindness, as well as the Joint WHO/FAO/UNEP/United Nations Centre for Human Settlements (Habitat) Panel of Experts on Environmental Management for Vector Control (PEEM), have a crucial impact on the way in which water resources are being managed. The hydrological aspects are dealt with by two programmes, IHP of UNESCO and the Operational Hydrology Programme (OHP) of WMO.

46. In addition to its work on the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, ECE has adopted policy

recommendations to Governments on water quality criteria and objectives for surface waters and their high ecological state, as well as policy guidelines on the ecosystem approach in water management. ESCAP is organizing an expert group meeting on the protection of water resources, water quality and aquatic ecosystems, to be held from 17 to 21 October 1994, with a view to formulating recommendations on ways to strengthen national capabilities for the protection of surface and ground waters.

47. The UNEP regional offices play an important political role in bringing countries together on water resource and pollution issues. Water quality monitoring services have been supported in a number of countries in Latin America, Africa and Asia through training of laboratory staff, provision of computer equipment and quality control services. Twinning arrangements between collaborating centres in developed countries and national and regional laboratories in developing countries were established for this purpose. Water pollution assessment and pollution control advisory services have been provided in several international river basins, for example the equatorial lakes and upper Nile, the Zambezi, the Mekong and the Rio de la Plata. In addition, national hydrological institutions were assisted in their efforts to deal with water quality problems. To this end, water authorities in the Caribbean were brought together to propose regional activities and to provide an input to the United Nations initiative on small island States. The assessment of water quality as a prerequisite for management has been launched in the Asia and Pacific region and throughout the territory of the former Soviet Union.

48. Advances in the protection of human health from contamination of water sources have been made through the revision of the WHO Guidelines for Drinking-Water Quality, which will provide the basis for regulatory action on pollution control, and the prevalence of water-associated diseases has been further reduced by intensive campaigns for guinea worm eradication in the affected countries. The protection of groundwater receives growing attention, and collaborating centres have been nominated by WHO for this purpose. Training is given to national water resource managers in Latin America, and region-wide studies were launched in the Pacific region. Pilot studies on aquifers underlying urban areas were completed in several regions.

49. In 1994, the Council of the United Nations University established an International Network on Water, Environment and Health (UNU/INWEH) as a joint international programme of the University and a Foundation in Ontario, Canada, established by the government of Ontario. The themes to be addressed by UNU/INWEH include general environmental impact assessment; protection and recovery of water supplies; toxicology; water supply and sanitation; wastewater treatment, remediation and reuse; and human health.

50. Considerable efforts have been made to improve cooperation since the preparatory process of UNCED, particularly with a view to bringing hydrology and water quality sciences close together. Annual meetings of the GEMS/WATER Steering Committee are used to streamline the activities of UNEP, WHO, UNESCO, WMO and FAO. The Water Supply and Sanitation Collaborative Council, at its second meeting (Rabat, September 1993), established a Council-mandated working group on water pollution control, designed to bring together United Nations organizations, other international organizations, non-governmental

organizations, bilateral donors and developing country representatives of the water sector in a joint effort to curb pollution of water resources.

D. Drinking-water supply and sanitation

51. Improved information concerning water supply and sanitation coverage at the country level is being obtained through the WHO/United Nations Children's Fund (UNICEF) Joint Monitoring Programme. Based on the information received from countries in the African region, the percentage of the urban population with safe water supply and adequate sanitation in 1990 is significantly lower than had been previously estimated. More than 25 per cent of the people in Africa have no access to safe water supply, and more than 40 per cent do not have adequate sanitation. Under such conditions, the lack of coverage expected by the year 2000 becomes alarming. The newly reported figures for rural water supply also indicate a lower coverage than had been initially reported. By contrast, the percentage of rural inhabitants with adequate sanitation appears to be higher.

52. In the case of the Asia and Pacific region, the new data indicate that, in urban and rural areas, there is a higher proportion of people with safe water supply, but there is a lower proportion of people with adequate sanitation services. The decreasing trend in relative urban sanitation coverage by the year 2000 remains a cause for serious concern. The number of countries providing information in the Latin America and Caribbean region and in Western Asia do not provide a sufficiently representative sample of the regions' total population to allow a revision of the previous data.

53. With regard to funding, the preliminary data obtained through the Joint Monitoring Programme leads to the conclusion that, "priority investment in water supply and sanitation has continued in the urban sector. Moreover, the bulk of this funding has been directed towards the better-off population". 12/

54. Since the United Nations Water Conference in 1977, and the International Drinking Water Supply and Sanitation Decade which followed, there has been much greater emphasis on the importance of international cooperation and on dealing with problems concerning drinking water supply and sanitation. In this context, following UNCED, the Government of France convened a Round Table on Water and Health in Under-privileged Urban Areas at Sofia Antipolis, from 21 to 23 February 1994. In addition, the Government of the Netherlands convened a Ministerial Conference on Drinking-Water and Environmental Sanitation at Noordwijk on 22 and 23 March 1994 (see E/CN.17/1994/12), which was preceded by a preparatory meeting of senior civil servants, held from 19 to 21 March.

55. Increasingly, United Nations organizations are developing cooperative programmes and activities with each other. A good example of meeting the needs of appropriate technologies and innovative developmental approaches is the UNDP/World Bank Water and Sanitation Programme. Another example of cooperation is the WHO/UNICEF Joint Monitoring Programme, whose goal is to strengthen or establish national capabilities for monitoring water supply and sanitation activities.

56. Other important inter-agency programmes having water supply and sanitation components include the Joint WHO/FAO/UNEP/United Nations Centre for Human Settlements (Habitat) Panel of Experts on Environmental Management for Vector Control (PEEM); the joint strategy for hygiene education in water supply and sanitation in the 1990s, which UNICEF and WHO have begun to develop; the collaboration between the UNDP/World Bank Water and Sanitation Programme and WHO on hygiene education activities in Africa and Asia; the UNDP/World Bank/UNEP Urban Management Programme; and the Task Force on Women, in which the Department for Development Support and Management Services, INSTRAW, UNICEF and the UNDP/World Bank Water and Sanitation Programme have been cooperating. In order to foster the greater involvement of women in the development and management process, INSTRAW, in cooperation with the Department for Development Support and Management Services and the International Labour Organization (ILO), developed multi-media training packages on women and water supply and sanitation. Funded by the Department, regional seminars for testing the revised modules were carried out in Africa (the Gambia, September 1991) and in Asia (Bangladesh, September 1992). In the case of Latin America and the Caribbean, ECLAC plans to prepare a study on the experiences of the countries of the region concerning the restructuring of the operation of water supply and sanitation companies, including their privatization, with emphasis on the role of tariffs in achieving greater efficiency and effectiveness in the provision of services.

57. The Inter-Agency Steering Committee for Water Supply and Sanitation has long played a central role among United Nations organizations. In November 1993, it became a working group of the ACC Subcommittee on Water Resources, with the responsibility for coordinating the implementation of joint drinking water supply and sanitation activities of the United Nations system. The Steering Committee is intended to perform a catalytic role with regard to the development of joint activities, and to establish a network of collaboration among relevant organizations. In a broader context, the Water Supply and Sanitation Collaborative Council is the main mechanism for the coordination of the overall policies and programmes of United Nations organizations with non-governmental organizations, bilateral organizations and other external support agencies. The Council established a working group on urbanization at its meeting in Oslo, in 1991. The Working Group was entrusted with the task of developing a strategy for the improved provision of services to urban areas. The activities of the Working Group are currently being continued by the Council's mandated activity on services for the urban poor.

E. Water and sustainable urban development

58. The availability of safe water in urban centres is fast becoming one of the most important factors limiting socio-economic development. In 1980, 19 of the 30 largest urban agglomerations were located in developing countries. By the year 2000, the total is expected to increase to 22, each with an estimated population ranging between 6.7 to 22.6 million people. Two cities in Asia (including Japan) had, in 1980, a population exceeding 10 million. By 1990 there were seven such cities, and it is estimated that their number will grow to 13 by the end of the century. By the year 2000, some 24 million people in Africa will be living in two cities with populations exceeding 10 million, and the population in cities with 1 to 5 million people will have grown by more than

350 per cent since 1980. In Latin America and the Caribbean, the population living in cities with 1 to 5 million people and over 10 million people will more than double over this 20-year period.

59. As a response to the rapid pace of urbanization in developing countries, and the escalating demands for the improved management of water resources, water supply, sanitation and drainage in urban areas, most organizations of the United Nations system are giving increasing attention to the execution of activities related to water and sustainable urban development. Some examples of this trend include the UNESCO/WMO initiatives on urban hydrology; the urban water supply and sanitation components of the UNDP/World Bank Water and Sanitation Programme; the growing activities of UNICEF in peri-urban areas; the inclusion of a special subprogramme to attend urban problems in the new WHO Enhanced Programme for the Promotion of Environmental Health; and the activities on water resources and urban infrastructure management being implemented by the United Nations Centre for Human Settlements (Habitat) Settlements Infrastructure and Environment Programme, the Sustainable Cities Programme and the Urban Management Programme.

60. Specific activities in response to Agenda 21 include the introduction of environmental impact assessment for major water resources development projects related to urban areas; the implementation of resource allocation decisions; the development of legal and institutional frameworks and planning mechanisms for the integrated management of urban development and water resources within a watershed; the protection of watershed from depletion and degradation of their forest cover and from harmful upstream activities; the promotion of public participation for the collection, recycling and elimination of wastes; efforts to mobilize and facilitate the active involvement of women in water management teams; the introduction of water tariffs, where affordable, which reflect the marginal and opportunity cost of water, especially for productive activities; promotion of the allocation of resources according to economic, social and environmental criteria; and the implementation of urban storm water runoff and drainage programmes.

61. The activities of the United Nations regional commissions, WHO and the UNDP/World Bank Water and Sanitation Programme have strong regional components. ESCAP, in close cooperation with the regional offices of WHO and the UNDP/World Bank Water and Sanitation Programme, held a regional seminar on water resources management in urban areas from 22 to 26 March 1993. ECLAC has been engaged in a project to provide medium-sized cities with improved planning and management capacity of water supply utilities. National activities in support of sector monitoring and assessment are also executed by the World Bank, UNICEF and WHO.

F. Water for sustainable food production and rural development

62. During the past four decades, irrigated agriculture provided a major part of the increase in production to meet population demands. By the mid-1990s, 35 per cent of total crop production came from less than 16 per cent of the arable land which was irrigated. On a global basis, the average rate of expansion was about 1 per cent per year in the early 1960s, reaching a maximum of 2.3 per cent per year from 1972 to 1975. The rate of expansion began to decrease in the mid-1970s, and is currently about 1 per cent per year.

Construction costs have risen steadily and world prices for major cereals have fallen sharply, and progressively less favourable and therefore more expensive areas are left for further expansion.

63. The FAO projection (World Agriculture Toward 2000) 13/ of expansion of irrigated land to the year 2000 was 2.25 per cent per year from 1982/84 to 2000. About two thirds of the increase in arable lands would be accounted for by expansion of irrigation. 14/ The World Bank estimates that although it will take an average annual growth rate of 2 per cent in agriculture as a whole to feed a world population estimated to reach 6 billion by the year 2000 and 8 billion by the year 2025, the growth rate for irrigated agriculture will need to be 3 per cent per year. Recent indications show that it will be difficult to sustain a 2.4 per cent annual growth in irrigation expansion in developing countries as predicted earlier. 15/

64. FAO estimates that, if major starvation is to be avoided, a minimum of 15.2 million hectares, at an estimated cost of US$ 45.52 billion, need to be brought into irrigated agriculture by the year 2000, over and above the 172.1 million hectares under irrigation by 1990. In addition, out of the 172 million hectares under cultivation by 1990, an estimated 17.21 million need to be upgraded by the end of the century, at an estimated cost of US$ 13.4 billion. An estimated 20 to 30 million hectares, globally, are severely affected by salinity and an additional 60 to 80 million are affected to some extent. The estimated cost for the provision of such drainage facilities at a rate of 1 million hectares per year for the remainder of the decade would amount to US$ 7 billion over the seven-year period, ending with the year 2000.

65. Agricultural requirements in the years to come will also necessitate the intensification of production in high-potential rain-fed lands where intensification will not result in overexploitation of the natural resource base or in environmental degradation. The improvement of a total area of about 10 million hectares within the period 1993-2000, constituting 2.5 per cent of the total high-potential rain-fed lands, would cost an estimated US$ 7 billion. In addition, approximately US$ 14 billion will be required over the same period for investments in aquaculture development.

66. An integrated approach to rural water management necessitates inter-disciplinary and inter-agency efforts for implementing the programmes at local, national, regional and global levels. With this in mind, a Technical Consultation on this subject was convened by FAO in March 1993, in close collaboration with UNICEF, UNDP, the World Bank and WHO, which produced broad guidelines for programme implementation and a number of specific recommendations for action. The Consultation underscored the importance of national water sector assessments, which have already been initiated under the programme area of integrated water resources management as a starting point for the identification of capacity-building needs and priorities.

67. An informal consultation on land/water linkages and river basin management was held in Rome from 31 January to 2 February 1994, sponsored jointly by FAO and the Natural Resources Management Institute of the University of Stockholm. The consultation aimed at developing a conceptual framework to predict land/water/environment interactions; establish a landscape and river-basin

approach to integrated land and water resources management; and draft a programme of action, including strategies and models for integrated water/land management on a landscape-ecological and catchment area basis.

68. The International Action Programme on Water and Sustainable Agricultural Development (IAP-WASAD), which was initiated in 1991, concentrates on action at the national, subregional and regional levels. Its goal is to assist member countries in meeting their freshwater needs for sustainable agriculture and rural development through formulation and implementation of action programmes in partnership with relevant United Nations organizations and multilateral and bilateral donor agencies. To date, national and subregional action programmes have been formulated in Egypt, Indonesia, Mexico, the Syrian Arab Republic, Turkey, the United Republic of Tanzania and Zimbabwe and in the Lake Chad basin. Activities are being initiated in Egypt, Indonesia and Turkey for the implementation of their respective programmes.

69. Comprehensive rural water supply programmes, based on village-level management and maintenance, are being carried out in many Sahelian countries by the Department for Development Support and Management Services with funding from UNDP and the United Nations Capital Development Fund (UNCDF). The Department and UNICEF have cooperated in the Niger and in Guinea-Bissau with the World Bank/UNDP joint programme for the Promotion of the Role of Women in Water and Environmental Sanitation Services (PROWWES).

70. A lack of adequate water for drinking and livestock sanitation in many arid and semi-arid regions of developing countries can seriously affect economic and social viability of pastoralism. FAO is focusing attention on the provision of drinking-water points, including water troughs in the semi-arid and arid pastoral lands of Africa. Joint activities with the UNESCO Man and the Biosphere (MAB) Programme on the impact of human activities and land use practices in grazing lands are being implemented. With regard to fisheries and aquaculture, FAO activities in support of these areas include a regional technical assistance project on Environmental Assessment and Aquaculture Development, covering 14 countries in the Asia and Pacific region.

G. New initiatives

71. As part of the activities within the ACC Subcommittee on Water Resources concerning the development of strategies for integrated water resources development and management, efforts are being made to assist developing countries in carrying out diagnostic studies of their institutional capacity, with a view to formulating water resources development strategies and policies. These efforts will seek to bring about a more multidisciplinary and inter-agency approach in order to ensure an integrated assessment of country situations and needs. Efforts are being carried out for the establishment of an integrated information network. The initial efforts of this incipient programme have been directed towards identifying available information and data gaps.

72. In response to the needs expressed by the International Conference on Water and the Environment and the recommendations contained in chapter 18 of Agenda 21, UNESCO and WMO, with the support of the World Bank, are promoting a

major long-term initiative to improve knowledge of the hydrological cycle through the development of a World Hydrological Cycle Observing System (WHYCOS). The initiative aims at alleviating the deficiencies that exist at the national, regional and global levels with respect to data required for effective water resources management and sustainable development. The proposal envisages the creation of a world-wide network of key stations linked by satellite with an associated quality-controlled database. The WHYCOS network would measure river flow and water quality variables, as well as on-bank temperature, humidity, radiation, wind speed, barometric pressure, precipitation and several related variables. It would employ the existing WMO World Weather Watch system, where applicable, and would in turn contribute data to it, as well as to the Global Climate Observing System and to the Global Terrestrial Observing System. In view of the seriousness of the situation in Africa, the initial focus of attention of the WHYCOS programme would be in that region, and the programme would extend over a period of 20 years. The estimated funding for the initial six-year period has been estimated at US$ 14 million. Similar approaches are being developed for Latin America and the Caribbean, for countries bordering the Mediterranean Sea and for the basin area of the Aral Sea.

73. A step towards regional cooperation was taken in 1993 when both the ACC Subcommittee on Water Resources and the Steering Committee for Water Supply and Sanitation recognized that the deteriorating water and sanitation situation in Africa required a special inter-agency effort to develop innovative and cooperative water resources development and management programmes to meet the most pressing needs of the region. WHO has been assigned responsibility to coordinate this effort on behalf of the Subcommittee, in consultation with UNDP, UNEP, FAO, ECA and other relevant organizations.

74. Within FAO, a number of Special Action Programmes are being established. One such Programme is on Rural Use of Water Resources for Sustainable Agricultural Development (SAP-WASAD), which is complementary to the ongoing Inter-agency Programme on Water and Sustainable Agricultural Development. The objective of SAP-WASAD is to promote a stronger inter-disciplinary approach to water management within agriculture, forestry and the fisheries subsectors under the FAO International Cooperative Programme Framework for Sustainable Agricultural and Rural Development (related to chap. 14 of Agenda 21).

75. Attention is drawn to the recommendations made by the Committee on Natural Resources, at its second session, addressed to the Commission on Sustainable Development. In particular, the Committee called for the formulation of an implementation plan to avert the pending water crisis, incorporating principles for the effective management of land and water resources, and guidelines and schedules based on Agenda 21 (E/C.7/1994/L.7, para. 5 (b)). The Committee further recommended that the Commission, "approve the formulation of the plan by the Working Group on Water of the Committee on Natural Resources jointly with the Administrative Committee on Coordination Subcommittee on Water Resources, drawing upon the results of the regional meetings of the United Nations Environment Programme already scheduled to address the issue and other relevant activities of the organizations and specialized agencies of the United Nations (E/C.7/1994/L.7, para. 5 (d) (ii)).

III. NATIONAL EXPERIENCE

A. Industrialized countries

76. As part of Canada's efforts to ensure that economic development takes place on a sustainable basis, provincial governments are moving towards an ecosystem approach to analysing environmental issues and to strike the necessary balance between competing demands. This has impacts on water management. Governments and major groups have worked together on a series of integrated assessment and environmental management plans for some of Canada's major river basins and the Great Lakes. Laws and regulations in more jurisdictions have been strengthened to expand protection of waterways and aquatic ecosystems. Regulations under federal and provincial legislation have been revised to set stricter limits on effluent discharges from pulp and paper mills. Fines and other penalties have been substantially increased for federal fishery offences, such as illegal dumping or the damaging of fish habitat. A new Canadian Environmental Assessment Act was proclaimed in 1993 and associated regulations are being developed.

77. Partnerships have become fundamental to addressing freshwater issues. One is the work of the Canadian Council of the Ministers of the Environment in developing a water strategy. This includes water conservation initiatives, water quality guidelines and development of a work plan for aquatic ecosystem health. Non-governmental organizations have recently organized a national water caucus under the auspices of the Canadian Environmental Network, in order to help the many environmental organizations working on local and regional water issues to share information, develop joint strategies and provide advice to governments. Several Canadian non-governmental organizations jointly organized the International Secretariat for Water, an international non-governmental organization headquartered in Montreal. Its aim is to foster cooperation among non-governmental organizations of all countries that are involved in drinking water and sanitation improvement for people in the southern hemisphere.

78. In a new national Action Plan for Fish Habitat, governments, groups representing indigenous people, industry and non-governmental partners in fisheries management are launching a programme to streamline the division of management responsibilities and to provide techniques and policies for local fish habitat management. It will address partnership arrangements, inventory and monitoring of resources, environmental analysis, regulations and guidelines, and planning and evaluation.

79. In Finland, an Environment Impact Assessment Act will shortly be laid before the Parliament. Impact assessment procedures are applied to projects which may have major environmental consequences. Assessment under other legislation will be part of environmental impact assessment under the envisaged Act in order to integrate different environmental sectors. An administrative overhaul is being undertaken. Issues regarding water protection and management, air protection, waste management, nature conservation and land use planning are assembled under new regional organizations and environmental district offices. The Government has approved long-term objectives until 1995 for the protection of waters, based on water use requirements and on safeguarding the functioning of ecosystems. A proposal for a conservation programme for waters was completed

in 1992. The plan covers 68 watercourses and parts of watercourses, which all have international or national conservation value. The approval process is presently under way.

80. The Finnish-Norwegian Commission on transboundary watercourses has drawn up integrated water resources development plans for the Tenojoki and Naatamonjoki river catchment areas. Finland and the Russian Federation have agreed on an action plan for water pollution control for their common transboundary watercourses. The action plan contains a comprehensive system for reporting on pollution loading in the area.

81. With regard to development assistance, the recommendations of UNCED have been incorporated in the new development strategy. The main targets in the development strategy are alleviation of poverty, improvement of democratic rights and a sustainable environment.

82. An Environmental Impact Assessment Act was adopted in Iceland in the spring of 1993 and new laws are being prepared for the protection of freshwater resources. Pollution control regulations have been tightened to meet European water quality standards. Action plans for the integration of environmental considerations into all sectors of society have been formulated. The feasibility of making comprehensive master plans for the conservation and utilization of groundwater resources, lakes and rivers and geothermal resources is being investigated. The environmental impacts of hydropower developments are being fully integrated in the master plan. A comprehensive cross-sectoral administrative framework for the collection and dissemination of environmental information and the development of environmental statistics and indicators has been developed. A national accounting system which includes the implications of economic activity for the environment and natural resources has been established. Public participation is being enhanced through the implementation of recently passed legislation, by which the public is to be provided with information on environmental affairs through the publication of a state of the environment report.

83. In the Netherlands, government policy on the protection of freshwater is contained in the Third Policy Document on Water Management. This is based on the principle of integrated water management, which involves safeguarding both the quantity of freshwater in the Netherlands, and the chemical and biological quality of the water itself. In the first place, the policy concentrates on effecting considerable reductions in industrial, domestic and diffuse discharges. The Netherlands now has one of the highest levels of sewerage and water treatment in the world. The wastewater of more than 92 per cent of the population is completely purified by the biological-oxidation method before it is discharged. Almost all industrial wastewaters are also purified. In addition to reducing emissions, measures are also being implemented to improve the environmental quality of surface water.

84. The Government is taking steps to curb increases in water consumption by households by encouraging people to save water. In households, this includes promoting the use of water-saving toilets and washing machines. In industry, the emphasis is on water used for cooling and other processes. Policy measures to combat water depletion have been stepped up in recent years. A target has

been set to reduce the areas affected by water depletion by the year 2000 by 25 per cent of the 1985 level.

85. The United States of America is working towards the goal of achieving a holistic approach that treats water resources as an integral part of an ecosystem, a natural resource and a social and economic good. Partnerships between the national Government and State and local governments are considered essential to achieving progress on water resource issues, as is the participation of non-governmental groups, industry and interested parties from the general public. The creation of effective partnerships with neighbouring countries is considered critical to management of transboundary water resources. Stable institutions, such as the United States/Mexico International Boundary Water Commission and the United States/Canada International Joint Commission, promote better management of shared resources.

86. The management of non-point source pollution is the most urgent water quality problem that needs to be addressed. The Environmental Protection Agency (EPA) has issued guidance for coastal states for achieving reductions, requiring that they implement the management measures through the use of enforceable mechanisms and policies.

87. EPA has worked with States and communities to develop wellhead protection programmes to protect drinking-water supplies. These programmes concentrate on protecting a community's underground sources of drinking water by delineating the groundwater resources around the community's well and by identifying the potential sources of contamination that could affect the groundwater.

B. Developing countries

1. Africa

88. In spite of the bleak assessment of the situation in the region, there is evidence of an increasing recognition of the importance of implementing the recommendations contained in chapter 18 of Agenda 21. The East Water Resources Seminar held in Entebe, Uganda from 24 to 27 May 1993, with the support of the Government of Denmark, agreed that the development and management of water resources in the East African region should be based on the general principles and guidelines emerging from the preparatory process of UNCED. It recommended that national water resources policies should follow general decentralization principles, and that guidelines should regulate the various roles, functions and decision-making processes at different levels. Participation at all levels, especially the private sector, should be promoted.

2. Asia

89. In October 1993, the State Planning Commission of China, together with the State Science and Technology Commission, issued a document entitled "China's Agenda 21". The document contains a chapter on freshwater resources, which includes a programme on the protection and sustainable development of natural resources. The objectives are to formulate long-term plans of water supply and

demand, and rationalize water resources based on an assessment of water resources; amplify necessary rules and regulations to develop rationally and protect water resources; improve water quality and supply capacity, and control water pollution; reform water resources management system and improve efficiency of water utilization; control domestic and industrial water consumption to alleviate water shortage and pollution; protect the aquatic ecosystem based on the interrelation of water, forest and land use; forecast climate change impacts on water resources, and formulate and pursue related policies for adoption.

3. Latin America and the Caribbean

90. In Bolivia, the environmental law of April 1992 established political and ethical principles for the protection and conservation of the environment and natural resources. The law establishes that the State will promote the integrated planning, development and use of water resources and will regulate the integrated and rational use, protection and conservation of water resources. The formulation of new water legislation is under study.

91. In Chile, the reform of the Código de Aguas (the water law), the creation of the Dirección General de Aguas (Head Office for Water), the replacement of the Dirección de Obras Sanitarias (Sanitation Works Administration) by the Superintendencia de Servicios Sanitarios (Superintendency for Sanitation Services), the creation of the Comisión Nacional de Riego (National Irrigation Commission) and the promulgation of the Ley de Fomento de Riego (Irrigation Improvement Law) have been among the most significant reforms. The result of these changes has been to change the thrust of the action of the State from that of almost complete responsibility for all aspects of water development and management to that of one of responsibility for the resource and of supporting and supervising user actions.

92. The reformed water law, although maintaining water as a public good, establishes private ownership over the water right once it has been granted by the State. The right can be freely transferred on the open market. Among the most significant innovations has been the establishment of one national body with comprehensive responsibilities for water resources data in the water directorate. From the water management viewpoint, equally significant are the reforms in the authority and responsibilities of the organizations of water users and in the role of public authorities in the management and construction of irrigation works.

93. Mexico, although a federal State, has, for a number of years, enjoyed a highly centralized system of water administration. This system has recently undergone a profound revision, which has changed the basis on which the administration operates. The Comisión Nacional del Agua (CNA) was created in January 1989 to replace the Secretaría de Recursos Hidráulicos and to concentrate responsibility for water management in one institution. Other government agencies, however, have responsibilities in respect of various aspects of water management. CNA is responsible for managing the supply of water and for the assignment of the right to use water. CNA must determine the natural supply, the water balance and the annual availability of water. Water rights are granted for a period of not more than 50 years, and can be revoked if

the use of the water is changed. The management of water use lies with a variety of institutions at the public, federal and state levels and with the private sector.

4. Western Asia

94. In Yemen, a new water law designed to provide for the licensing of new wells and for a more orderly set of arrangements for water abstraction, is being considered by the Government. In order to improve the institutional framework for water resources development and management, a proposal to integrate various water-related functions under one government institution is receiving serious consideration. The Government has established the High Council for Water, supported by a technical secretariat, in order to improve the water sector planning. The technical secretariat has been entrusted with the task of preparing a National Water Master Plan for the country.

95. Similarly, Oman has established a Ministry of Water Resources in order to institute a comprehensive management of its water resources by a non-user institution.

C. Economies in transition

96. In Estonia, a goal of the Tallinn Environment Project Feasibility Study is to improve administrative structures, as well as legislation and standards for water management. The project takes into account the economic value of water with a view to increasing efficiency and the generation of financial resources.

IV. CAPACITY-BUILDING, TECHNOLOGY AND FINANCE

A. Capacity-building

97. The decay in the ability of many countries to deal with the assessment of water resources, both from a quantitative and qualitative point of view, the fragmentation of water management responsibilities among numerous government ministries and departments, the inability of many government agencies in developing countries to attract and retain trained personnel, the lack of policy frameworks defining the nature of government interventions and strategies for water resources development and management, and the lack of suitable legislative frameworks, suggest that institutional constraints constitute the major obstacles to the implementation of the recommendations for the sustainable development of water resources contained in chapter 18 of Agenda 21.

98. There is an increasing recognition by Governments of the importance of capacity-building in this respect, and a number of such Governments have carried out, or are in the process of carrying out, water sector assessments with a view to producing a diagnosis of their situation and formulating strategies for the future.

B. Technology

99. Given the ever-increasing demands on a limited stock of freshwater resources worldwide, the development and use of technologies aimed at augmenting water supplies, limiting pollution and conserving the resources is essential, particularly in developing countries and economies in transition.

100. Technologies for augmenting the supplies of water resources are commanding greater attention. By 1990, desalinated water from sea and brackish waters and treated wastewaters in Western Asia provided the equivalent of 6.5 per cent of the total available freshwater resources in the region, and the proportion is expected to increase to 7.4 per cent by the year 2000. The installed desalination capacity of the Gulf countries amounts to 49.5 per cent of the total world capacity. 8/ While desalinated water is still too expensive for agricultural uses, it can play an important role in providing water for certain industrial purposes and for the tourist industry, particularly in island countries. The treatment of wastewaters is fast becoming critical as a source of water mostly for agricultural uses, and as a means of decreasing the amount of pollution discharges into freshwater sources. The transfer of this type of technology and the dissemination of health safety standards for their application are essential for developing countries.

101. The use of water-saving technologies will have to become far more widespread in the near future, especially in developing countries. These technologies will be of particular importance in the case of agricultural water uses, where, globally, around 70 per cent of water withdrawals are for agriculture. The overall proportion of water used for agriculture will need to drop to 62 per cent by the year 2000 because of increasing demands for competing uses. 10/ Currently, withdrawals for agricultural uses account for as much as 91 per cent of the total in low-income countries. Similarly, the profligate use of water by the urban rich in many countries will have to be curbed.

102. Equally important to developing countries and economies in transition will be the increased use of clean technologies. While there may be a temptation to settle for less capital-intensive more-polluting technologies with a view to maximizing short-term economic gains, such gains will, in most cases, prove to be illusory in view of the environmental and health costs incurred which will have to be faced in the future. The proper use of the "polluter pays" principle will be instrumental in promoting the use of cleaner technologies.

103. An important lesson that has been learned from the International Drinking Water Supply and Sanitation Decade, which can also be applied to other sectors, particularly in the case of small-scale irrigation, is the importance of adopting technological solutions that are appropriate to the specific needs of the community in question. The appropriateness of a given technological solution, in addition to being a function of cost, is also related to the suitability of designs to the needs and aspirations of the community, the ability and willingness of the consumer to pay, and the operation and maintenance requirements of specific technologies relative to the capacity of communities to carry out these functions. Close consultation with users is an essential element in a successful choice of technology.

C. Finance

104. The financial resources needed for the implementation of chapter 18 of Agenda 21, if they are to be met, will require increased efforts from Governments and the international community, as well as increased contributions from users. So far, indications are that financial allocations from various sources are falling short of the mark.

105. As mentioned earlier, water resources assessment activities have suffered from neglect in recent years as a result of dwindling financial allocations. All too often, the economic value of water resources data has not been recognized even though such data are essential to development activities. Due to the frequent fragmentation of responsibilities among governmental ministries and departments, organizations dealing with water resources assessment are not sufficiently linked to those dealing with development and management and, hence, do not receive the necessary support, nor do they necessarily produce the data required for development when and where they are needed. The current situation clearly suggests that greater attention to this issue is also needed at the international level. The WHYCOS programme (see para. 72 above) has not as yet found financial backing.

106. In view of the increasing scarcity of water resources of a sufficiently good quality, and the rising costs of securing adequate supplies, there is a need to stress the economic aspects related to development and allocation of water resources. Increasing attention needs to be given to user fees and to the issue of subsidies. In the case of water supply and sanitation, case studies have shown that a number of peri-urban poor communities are in fact paying very high fees for water from local vendors and that they would be able and willing to pay for services from local utilities providing better services at a lower cost, particularly when the design of the services provided complies with their requirements. Where subsidies to the poor are deemed to be essential and where such subsidies are not financed through cross subsidies from higher-income communities, the incidence of the subsidy should not fall on the public or private utility providing the services, as this would impair the operation and maintenance capability of the utility as well as the capability to generate investment capital. Unless there are clearly demonstrable social reasons for it, subsidies should not be given to higher income groups. In this regard, the WHO/UNICEF Joint Monitoring Programme has found that "Governments are subsidizing water systems and sanitation services to the better-off populations by around 70 per cent of recurrent costs, as compared to approximately 50 per cent towards the lower levels of service provided to the urban low-income and marginal areas, and less than 40 per cent of the much lower operation and maintenance costs (O&M) in the rural areas". 17/

107. Irrigation projects are some of the most heavily subsidized economic activities in the world. In some cases, subsidies to irrigation covered 90 per cent of the total operating and maintenance costs. 18/ The magnitude of such subsidies not only limits dramatically the generation of funds for operation and maintenance and for capital investment, but also introduces serious dislocations in the allocation of water resources among competing uses that will not be sustainable in the future in view of increasing demands. The question of user fees for irrigation is closely associated with the

appropriateness of scale and design in terms of affordability and capacity for operation and maintenance.

108. The "polluter pays" principle needs to be given the closest possible attention in order to generate the financial resources for treatment and to induce the use of cleaner technologies. The concept of trading permits is gaining in acceptance both in the United States and in the United Kingdom of Great Britain and Northern Ireland, in the case of air and water pollution. Under this concept, polluters are able to trade pollution allowances within an overall limit. This approach may motivate companies to invest in more efficient pollution abatement technologies, enabling them to reduce discharges below the permissible limits and to sell the balance to other companies for a profit. Other companies may in turn find it more economical to purchase pollution allowances as the lowest-cost alternative to compliance with pollution standards.

109. The private sector is playing an increasingly important role as a source of investment capital and in the operation and management of water resources utilities. This is the case not only in industrialized countries, such as the United Kingdom and France, but in many developing countries as well. The potential benefits of intervention by the private sector in developing countries are evident, not only in terms of the flow of financial resources, but also in terms of bringing technical and managerial know-how and providing financial and managerial autonomy to utilities.

V. CONCLUSIONS AND PROPOSALS FOR ACTION

110. Early feedback from the follow-up to the International Conference on Water and the Environment and to UNCED indicates that there is greater acceptance of the importance of a suitable enabling environment and for the concept of integrated water resources planning. Similarly, the concept of water as a scarce resource and as an economic good also seems to be gaining acceptance.

111. There is a trend towards decentralization of authority and a separation of functions between organizations responsible for policy formulation, and those in charge of implementing projects and managing utilities. There has also been an increasing awareness of the importance of the role of women in the management, development and utilization of water resources. Unfortunately, however, data on the extent and impact of women's participation are lacking. The lack of information for planning and decision-making and an inadequacy of monitoring capabilities are still pervasive problems in developing countries. This refers not only to the assessment of surface and ground waters, both in terms of quantity and quality, but to water use and to the interrelationship between land and water as well.

112. Very serious problems persist, and in some cases these problems are becoming alarming. While considerable progress has been made with regard to the eradication of some water-borne diseases, notably guinea worm, the outbreak of cholera in recent years illustrates the possible magnitude of an impending health crisis, particularly around urban concentrations. More and more rivers, recipients of untreated urban waste discharges, are becoming open sewers, and

pollution from the indiscriminate use of agro-chemical products is often rampant. Equally alarming are the increasing levels of pollution from the disposal of toxic chemicals. Water resources of suitable quality are becoming scarce and increasingly expensive.

113. Recent international forums dealing with water resources issues have all brought about an increasing awareness of the global magnitude of an impending water crisis. There is a growing consensus among experts in the water resources field about the seriousness of the situation. However, the spectre of a global water crisis has been overshadowed by concerns about other issues of manifest global proportions, such as the ozone layer, tropical forests and climate change. Internationally the seriousness of water problems has not as yet received the recognition warranted by the situation. At the national level, particularly in developing countries, whatever measures have been taken, albeit in the right direction, have generally not been commensurate with the scope of the problems. Water resources will not receive greater priority unless a strong case is made to this effect, and international attention is focused on the need to assess the real magnitude of the problem and bring about effective solutions.

114. Information concerning the availability and quality of surface and ground waters is often insufficient, and in many cases the capacity to collect data has been waning. The situation is even less satisfactory with regard to water resources uses, waste-water disposal, the interrelationships between population, land and water, and the impact of the application of economic and legal instruments to water resources use and pollution control. Due to a lack of integration between water resources policy and planning and economic policy at the national and regional levels, whatever information might be available fails to find its due place in the national policy-making and planning process.

115. There is clearly a need for Governments to embark on a major effort to monitor key socio-economic, physical and environmental variables related to the assessment, development, utilization and management of water resources as an essential condition to progress. As a matter of urgency, Governments need to develop and implement monitoring strategies for the collection, analysis and dissemination of data of demonstrable value, including the formulation of methodologies for evaluation of environmental variables. Equally, at the international level, there is an urgent need for the systematic gathering of information on the availability of the resource, including water quality data, and on the demand for water for various uses, with a view to providing reliable assessments of the state of the water resources of the world.

116. The formulation of policies and the implementation of holistic strategies presupposes the existence of institutional structures which achieve a high degree of horizontal integration within the various sectors of water resources, including management structures at the lowest appropriate levels and vertical integration with the national socio-economic planning process. If significant long-term progress is to be achieved in the implementation of chapter 18 of Agenda 21, priority attention needs to be given to the establishment of "a dynamic, interactive, iterative and multisectoral approach to water resources management, including the identification and protection of potential sources of freshwater supply". 19/ To this effect, Governments should consider the need to carry out a diagnostic assessment of the current situation *vis-à-vis* their

current institutional arrangements and human resources capacity, with a view to formulating a strategy and an action plan for the years to come. Priority attention needs to be given by the international community to capacity-building programmes in support of efforts by developing countries and economies in transition.

117. Financial support for the implementation of the recommendations contained in chapter 18 of Agenda 21 has significantly fallen short of requirements. At the national level, while there is a need for Governments to increase the share of development funding allocated to water resources, such as in the case of water resources assessment, urgent attention needs to be given to the implementation of pricing policies that take fully into account the user's ability to pay. Governments need to ensure that subsidies, when given, do respond to the social and economic needs of the needy rather than being granted to middle- and high-income strata of society. Serious consideration needs to be given to the role of the private sector in generating financial resources and as a provider of services. Funding by the international community has also fallen short of the mark.

118. In terms of the activities of the organizations of the United Nations system, major efforts will have to be made in order to assist Governments in a concerted manner with their capacity-building efforts and in the development of strategies for the implementation of chapter 18 of Agenda 21. The development of a global implementation plan incorporating guidelines and schedules for the implementation of the chapter and the establishment of an information network for the assessment of the freshwater resources of the world, if approved by the Commission, will require high levels of cooperation among the organizations above and beyond the levels of their current programmes, and will also require close cooperation and support from interested Governments and intergovernmental and non-governmental organizations.

119. As is the case for ACC and its other subsidiary machinery, the ACC Subcommittee on Water Resources remains a forum open only to the organizations of the United Nations system. Nevertheless, contacts with other external support agencies, non-governmental organizations and professional and scientific organizations take place through the Subcommittee's working groups and through seminars, symposia and technical consultations convened by the various organizations. The most permanent and systematic forum for a wide dialogue among all the organizations concerned is to be found in the form of the Collaborative Council for Water Supply and Sanitation, which meets every two years and has a small secretariat based at WHO headquarters. Regarding the formulation of concerted approaches to integrated management of freshwater resources, the need for further dialogue remains.

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REVIEW OF SECTORAL CLUSTERS, FIRST PHASE: (a) HEALTH, HUMAN SETTLEMENTS AND FRESHWATER

Assessment of progress achieved in promoting sustainable human settlement development

Report of the Secretary-General

SUMMARY

This report covers progress achieved in the implementation of chapters 7 and 21 of Agenda 21, on promoting sustainable human settlement development and environmentally sound management of solid wastes and sewage-related issues. It is based in large measure on information supplied by the United Nations Centre for Human Settlements, acting as task manager for the Inter-Agency Committee on Sustainable Development (IACSD) and other agencies of the United Nations system with programmes and activities related to chapters 7 and 21. The full report of the task manager is supplied as a background paper for the information of the Commission. This report also incorporates, to the extent possible, information provided in country reports and reports of non-governmental organizations. Particular attention is invited to section IV, containing conclusions and recommendations.

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INTRODUCTION

1. The Commission on Sustainable Development adopted a multi-year thematic programme of work at its first session in June 1993 as the framework to review progress achieved in implementing Agenda 21. Under the terms of the programme of work, the Commission requested that a number of thematic reports be prepared for its sessions between 1994 and 1996. The present report is one of the five thematic reports requested by the Commission's programme of work for 1994. It is based on a background paper on human settlements prepared by the United Nations Centre for Human Settlements (UNCHS) (Habitat). 1/

2. The present report reviews the trends and needs in implementing chapter 7 of Agenda 21, on promoting sustainable human settlement development. It also summarizes a number of reports received from Governments and discusses the role and contribution of major groups concerned with human settlements, including non-governmental organizations, business and industry, and two organizations of local authorities.

3. The report focuses on the main trends that can be observed in the governmental, intergovernmental and non-governmental spheres and presents a number of recommendations for the consideration of the Commission.

I. GENERAL OVERVIEW

4. Chapter 7 of Agenda 21 contains over 100 activities under eight programme areas:

(a) Adequate shelter for all;

(b) Human settlement management;

(c) Sustainable land-use planning and management;

(d) Environmental infrastructure;

(e) Sustainable energy and transportation in human settlements;

(f) Human settlement planning in disaster-prone areas;

(g) Sustainable construction industry activities;

(h) Capacity-building for human settlement development.

The chapter's estimated financial needs constitute one third of the annual estimated cost of implementing the entire Agenda 21 and is the highest cost estimate (over US$ 200 billion per year 2/) among all the chapters of Agenda 21.

5. The chapter's programmes advocate an enabling approach as well as cooperation with a wide range of public, private and community partners in the pursuit of sustainable development. The accent is on broad-based participation

and on an intersectoral and integrated approach to human settlements management and development.

6. Statistical figures illustrate the growing importance of human settlements issue in sustainable development efforts. About 1.3 billion people, mostly in developing countries, live in urban areas that do not meet World Health Organization (WHO) standards for airborne dust and smoke. Globally, one out of five individuals lives in cities that exceed WHO standards for sulphur dioxide. Currently, 1.4 billion people are living below the poverty line and up to one third (and sometimes more) of urban populations live in substandard housing. Global population is expected to increase by 3.7 billion people by 2030. Ninety per cent of this increase is estimated to take place in developing countries, of which 90 per cent will be urban. This puts the sectoral programme activities of Agenda 21 against the background of the human settlements issue: most Agenda 21 activities are likely to be implemented, coordinated, and managed in cities and towns.

7. Human settlements are increasingly the focus of attention in dealing with national and international problems such as poverty alleviation, unemployment, population growth and consumption patterns at the source - that is, at the local level. However, breaking the cycle of poverty and environmental decline will, paradoxically, require further economic growth, most of which is likely to take place in the towns and cities of developing countries. This places chapter 7 in a central place in the implementation of Agenda 21.

II. REVIEW OF PROGRESS ACHIEVED IN THE PROGRAMME AREAS OF CHAPTER 7

A. International cooperation

8. United Nations system-wide activities relevant to chapter 7 seem to concentrate on human settlements management, environmental infrastructure, and capacity-building. New initiatives in other programme areas, such as urban transport and land resource management, are somewhat fewer. Similarly, although there is general agreement that shelter is an important issue to be addressed, this has not been followed by accelerating the implementation of activities in programme area (a) (adequate shelter for all) through programmes such as the Global Strategy for Shelter by the Year 2000.

9. In the majority of United Nations agencies, there appears to be limited change in work programme priorities specific to the programme areas of chapter 7. Some important exceptions include, inter alia, the Secretary-General's decision, in early 1993, to foster a closer working relationship and joint programming between UNEP and UNCHS (Habitat). 3/ Similarly, the World Bank created a vice-presidency for environmentally sustainable development, also in 1993. 4/ These new initiatives are facilitating the type of cross-sectoral approaches to settlements management which is essential to the successful implementation of Agenda 21. Another initiative, UNDP's Capacity 21 Programme, launched in direct response to Agenda 21, appears to have the potential to contribute to the implementation of

chapter 7, especially if it is part of a broader inter-agency partnership for human settlements activities.

Programme area (a)

10. The objective is to achieve adequate shelter for rapidly growing populations and for the currently deprived urban and rural poor through an enabling and environmentally sustainable approach to shelter development and improvement. Success in this programme area depends largely on the degree of collaboration and partnership between the Government and the wide range of economic agents and social groups involved in the construction of housing.

11. The major global programme for achieving adequate shelter for all is the Global Strategy for Shelter to the Year 2000, developed by UNCHS (Habitat) in 1988. This Strategy calls for the establishment of an enabling legislative and regulatory environment that can facilitate accelerated improvement and construction of housing, particularly by the urban and rural poor. Numerous examples of post-UNCED inter-agency collaboration exist. Among these are the Shelter Strategy Support Programme (Habitat/UNDP); Housing Indicators Programme (Habitat/World Bank); shelter-related lending operations of the World Bank; and the building standards and regulations projects (UNIDO/Habitat). However, the existing level of national and international work on shelter for all is below the current demand and future needs.

Programme area (b)

12. The main objective is to ensure sustainable management of urban settlements so as to improve the living conditions of people as a way to reach economic development goals. A strategic approach in this area has been the Urban Management Programme (Habitat/World Bank/UNDP). The Programme emphasizes research, information dissemination and capacity-building through regional networks of expertise. It focuses on five core issues: land management, infrastructure management, municipal finance and administration, urban poverty alleviation, and the urban environment. Its main environmental arm is the Sustainable Cities Programme which works with local authorities and their public and private partners.

13. Other relevant international projects are the Healthy Cities Programme (WHO); 5/ the Municipal Development Programme for Africa (World Bank); Urban Poverty Partnership (ILO/Habitat/UNDP/United Nations Volunteers); Urban Basic Services and the Area-based Programmes (both of UNICEF); 6/ and the growing environmental lending programme of the World Bank in the urban sector. A continuing problem area is reaching a common vision of urban development shared by the multilateral and bilateral institutions. 7/ A common vision in this area is also likely to improve governmental, intergovernmental and non-governmental partnerships.

Programme area (c)

14. The objective is to provide for the land requirements of human settlements through environmentally sound physical planning and land use that facilitate

access to land and, where appropriate, the encouragement of communally and collectively owned and managed land.

15. Activities in the programme area involve promoting advancing, monitoring and assessing land policies and strategies, studying the impact of land-related activities on human settlements development, analysis of procedures, regulations and instruments for the progressive modernization of land-tenure systems, and the formulation and implementation of land policies. An innovative approach relevant to this programme area has been "land sharing". 8/ Other efforts include the Urban Management Programme, which provides advisory assistance on land tenure and land development policies and mechanisms. Bilateral assistance in this area also appears to be growing.

16. Matching the challenge of rapid urban growth and its multiple and conflicting demands on land poses a problem. The ongoing bilateral and multilateral efforts appear to be below the level of current needs.

Programme area (d)

17. This programme area is closely related to that of chapter 21 of Agenda 21, on solid waste management, which is also slated for review by the Commission on Sustainable Development in 1994. Instead of a separate report, a brief note on chapter 21, prepared by UNCHS (Habitat), is to be found in the annex below.

18. This programme area targets the year 2025 for the provision of adequate environmental infrastructure facilities in all settlements. Agency initiatives mentioned earlier, such as the Sustainable Cities Programmes and the Community Development Programme, direct their activities towards local capacity-building, addressing equity concerns through standard-setting, and building partnerships among the range of institutional actors. The World Bank, UNDP and UNCHS (Habitat) are taking steps to assess the potential role of the private sector and to develop programmes that would strengthen this sector's involvement in infrastructure development.

19. The ongoing programmes have produced a number of lessons which need to be integrated into future programme design. Among them are the limitations of sectoral planning; lack of community involvement in project development; emphasis of investments in new provision at the expense of maintenance; and inadequate financing for infrastructure suppliers.

Programme area (e)

20. This programme area aims for the wider use of new and renewable sources of energy and efficiency in the household and in the transportation of people and goods in the human settlements.

21. Numerous United Nations agencies are involved in promoting new and renewable energy systems and technologies; UNIDO promotes their manufacture, UNESCO provides training in their use and development, FAO is involved in fuelwood production, and UNCHS (Habitat) promotes wider use of biomass energy technologies. The World Bank has extensive lending for urban transportation, and the assistance is accompanied with considerable research on the issue. This

is an area where regional economic commissions carry out a number of activities such as workshops (ECE), guidelines for sustainable energy and transportation (ECA), and manuals for sustainable human settlements (ESCWA). The existing multilateral work appears to lack common policies and strategies. Furthermore, there are inadequate monitoring mechanisms and lack of a comprehensive approach to energy efficiency in human settlement development.

Programme area (f)

22. Long-term environmental disaster reduction is relatively new to United Nations policies on disaster mitigation and preparedness. Most United Nations-system activities are responses to sudden natural disasters rather than long-term preventive strategies.

23. Among the contributions to more long-term results are developing risk and vulnerability assessment methods (UNICEF and UNDRO); incorporating hazard reduction into human settlement planning and management (UNCHS); developing and disseminating know-how on disaster-resistant construction materials (UNIDO); and improving preparedness (UNDRO).

24. Future activities in these and other United Nations programmes need to be better linked to sustainable development programmes. Additional areas to be addressed are orienting technical assistance programmes to build local capacity for natural hazards management; supporting the establishment of early warning systems; and improving cooperation between United Nations agencies, international non-governmental organizations and multilateral institutions.

Programme area (g)

25. The primary objective is to enable policies, strategies and technologies for the construction sector to meet human settlement development goals while avoiding harmful side-effects on human and environmental health.

26. A post-UNCED inter-agency initiative in this area is the Global Consultation on the Construction Industry, organized jointly by UNCHS and UNIDO. Other initiatives include UNDP's database for urban technologies, including data for construction, ECE's promotion of environmentally friendly building regulations, and ECA's efforts to disseminate information on sustainable construction practices.

Programme area (h)

27. Two issues are of particular importance in this programme area: basic services related to urban infrastructure, and municipal solid waste management. The key actor is the local urban authority.

28. United Nations agencies, particularly UNCHS, have ongoing programmes that provide training services as well as other capacity-building technical assistance to local authorities. Most of the programmes already mentioned involve capacity-building in the urban context. There are also specialized programmes at the regional levels, such as the Training of Trainers in Support of Municipal Management for Arab States by UNCHS/UNDP and bilateral donors.

29. It is uncertain whether the above-mentioned and other relevant initiatives entail significant human and financial resource allocations to human settlements-related issues by agencies. The ongoing trend of reduced multilateral aid flows and reduced budgets of funding agencies is likely to be an obstacle. The recent shifts in the style of work of some agencies towards increased demand orientation, consensus-building and capacity-building could be the beginnings of increased resource allocation and sharing. The UNCHS working paper indicates the need for more effective inter-agency coordination, which would respond to the scope of coordination and monitoring required to implement Agenda 21, including the area of human settlements. Given the shrinking of multilateral resources, it appears that joint programming should become the order of the day. The working paper also indicates a need to consider establishing funding mechanisms that reward multi-agency programmes which pursue Agenda 21 goals in cooperation with the "major groups".

B. National experience

30. On the whole, the information received from Governments justifies observations rather than strong and reliable trends. 9/ Reports received from developed countries were in general more detailed and more focused on the programme areas of chapter 7. This may be an indication that developing countries require further assistance, cooperation and other technical support in monitoring Agenda 21 implementation to balance the information from developed and developing countries.

1. Developing countries

31. A programmatic review of activities related to sustainable human settlements in the developing countries will require more specific and detailed information. Of the reports received, none had specific programmatic information, and few reports had distinct sections relevant to chapter 7 as a whole. Furthermore, more reports would be needed to make geographical comparisons or identify regional trends.

32. Some developing countries indicate that they have formulated national housing strategies, land tenure bills, agricultural and land development zoning regulations and infrastructure investment programmes. One country indicates having designed an infrastructure investment programme for small and medium-sized towns and cities.

33. No information was provided on energy and transport, on management of disaster-prone areas or on the role of the construction industry, even though these issues were raised by developing countries in the UNCED process. Many developing countries indicate their need for financial and technical assistance in the area of setting sustainable human settlements policies and providing the related services. However, the magnitude and the content of their requirements need to be specified. In addition, although developed countries claim that their bilateral programmes involve local communities and capacity-building in developing countries, this information is not reflected in the developing country reports.

2. Countries in transition

34. In the reports of the countries in transition, there is the same lack of specific programmatic information and lack of overall information on chapter 7.

35. Two reports were received from this group of countries. One did not have information on the human settlements issue. The information from the other report indicates an urgency to integrate human settlement issues into the ongoing process of transition to a market economy. While the latter report does not raise shelter as a universal problem, the need for maintenance of existing buildings and the need to build new ones with greater energy efficiency are mentioned. It also mentions regional planning and the need to coordinate the various recently autonomous local authorities. The preservation of historic monuments is a matter of concern. Although this is a "traditional" pre-UNCED focus to a "human settlements" issue, it may also be an indication of the detrimental effect of air pollution in that part of the world. The country also reports that it has established technical standards for new buildings and has initiated an architectural information programme to assist local authorities and professional groups vis-à-vis the construction industry.

3. Developed countries

36. In the developed countries the emphasis was on maintaining the existing housing and human settlements infrastructure rather than building new housing; increasing the energy efficiency of existing housing; recycling building materials and in other ways collaborating with the construction industry and the relevant professional associations; promoting preventative policies to deal with urban issues through community participation and support; and reducing household waste through recycling and the management of hazardous waste in urban settings. More often than not, the programmes related to these issues are ongoing rather than specifically designed to respond to Agenda 21. Information provided by this set of countries enabled the following programmatic review.

Programme area (a)

37. Most developed countries seem to have relatively few needs with respect to shelter for all, although the figures given are scant and difficult to compare. Nevertheless, there are indications that housing is relatively adequate, with an average ratio of roughly 400 housing units per 1,000 persons. The figures also indicate that, despite the problem of homelessness, relatively universal housing is an achievable goal in most developed countries.

Programme area (b)

38. Activities on human settlement management are focused on preventative and pro-active efforts. Among them are programmes and efforts to reduce urban sprawl and the erosion of rural populations, programmes supporting community involvement, experiments in designing sound residential areas such as eco-villages, and decentralizing efforts to increase the role and contribution of local government.

Programme area (c)

39. Land-use planning and management are covered by varied legislation and institutional capacity. Institutionally, there is no common element, since the administrative and economic bases of land management are not uniform. There is a trend to integrate land management with environmental impact assessments. Some developed countries find their urban planning satisfactory but indicate the need for further work in rural settings.

Programme area (d)

40. On the whole, developed countries indicate adequate coverage of infrastructure needs. At present, waste minimization and management appear to be priorities. Some have set waste reduction targets to be reached by local governments. There is adequate coverage of energy supply where the focus is on efficiency and alternative energy supplies rather than achieving universal electrification goals. Again, the focus is on maintaining and improving the existing infrastructure. Some countries indicate their need for more decentralized but regionally coordinated approaches to improving the existing infrastructure. (See annex for a review of progress in solid waste management and related recommendations.)

Programme area (e)

41. Energy and transport are highlighted issues. Efforts seem to focus on providing adequate public transportation to reduce the use of personal transport, which leads to urban air and noise pollution. There are efforts to design comprehensive energy policies, compulsory energy conservation requirements and other energy-saving measures, and support for related research and development of alternative technologies and systems. Many indicate that they have technical and financial programmes to transfer related knowledge and technologies to developing countries.

Programme area (f)

42. Only a few developed countries provide information based on the geographical circumstances of disaster-prone areas. Several, located on geophysically active land or frequently affected by rising sealevels, seem to have early warning systems and other national policy instruments in place to prevent unnecessary damage. Those countries are also engaged in technical and financial assistance to developing countries affected by similar geographical conditions.

Programme area (g)

43. Cooperation with the construction industry appears to be integral to reported efforts. The focus is on increased use of secondary materials, overall recycling and efficiency of resource use and various incentives and targets to reach these goals. One country cites cooperation with the private sector to reduce homelessness in urban settings. Another country mentions the role of professional associations with regard to the construction industry. Energy efficiency in the urban setting is highlighted.

Programme area (h)

44. Capacity-building is part of the efforts noted above. Many capacity-building efforts are focused on international collaboration through United Nations agencies such as joint bilateral programmes with UNCHS (Habitat) and international non-governmental organizations such as the International Council for Local Environmental Initiatives. Bilateral efforts are also carried out regionally with neighbouring countries. However, more information on the financial and administrative details of these efforts is needed.

C. Roles and initiatives of major groups

1. Local authorities

45. Reports were submitted by two organizations of local authorities: the United Kingdom chapter of the International Union of Local Authorities (IULA), and the International Council on Local Environmental Initiatives (ICLEI).

46. The first report focuses on the local Agenda 21 initiative in the United Kingdom. Efforts involve five local authority associations, the local government management board and the local Agenda 21 steering group. The steering group has also asked a number of other organizations to join in the efforts. Among them are organizations that represent women, industry, trade unions, educators and environmental concerns. 10/

47. The work programme of this group of local authorities involves development of sustainability indicators, training programmes, conducting a series of round tables to formulate practical guidelines, and studies on examples of good practice. Included among the guidelines are a guide to local Agenda 21, a practical guide to design and construction, and a guide to eco-management and audit schemes. These are widely shared among the participating local governments. Through the international structure of IULA, there are efforts to disseminate the findings and the tools developed to local authorities in other countries.

48. The International Council on Local Environmental Initiatives report focuses on needs and potential contributions by local authorities to the programme areas of chapter 7. For example, under capacity-building, the report suggests four main needs: decentralization; stabilization; financial strengthening; and productivity enhancement, technology transfer and new product development. Among the specific recommendations are enabling local authorities to establish new sources of revenue (for example, by reforming the user fees to cover cost of services); supporting and integrating innovative (public or private) approaches in the context of "public enterprises" such as local authority-run utilities. The report also makes some tangible suggestions: for example, local authorities might facilitate negotiations between land owners and squatters; secure leases for squatter communities; train poor communities on the financial and legal aspects of land purchasing and management; and establish land banks and revolving loan funds for land purchases.

49. According to the background paper of UNCHS (Habitat), twinning programmes of local authority associations have led to exchanges and projects between the North and the South. Many of them are directly focused on human settlements development, especially on the improvement of management and technical skills at the administrative level. These efforts could be further strengthened by cultivating better linkages with developing country networks of local authorities and professionals in order to avoid parallel efforts that are duplicative or even contradictory. The existing regional and national networks also need to be strengthened. A regional focus that involves the Asian Coalition for Housing Rights and the Settlements Information Network Africa (SINA), among others, could be a start in that direction.

2. Non-governmental organizations

50. The positive initiatives of community groups, including women's groups, to develop local solutions to locally defined problems are being reported from several countries. Local groups are active in renewable energy technologies, energy-efficiency projects, recycling and the reuse of wastes, and many other areas.

51. There has been a continuation and strengthening of trends, experiences and experiments in the non-governmental organization sector which were evident prior to 1992. Three trends are worth noting:

(a) Greater dialogue and cooperation between non-governmental organizations and government institutions, including national and local governments and other state organizations;

(b) Increased knowledge of and sophisticated use of the media, market mechanisms and the private sector;

(c) Greater awareness of the links between environment and development objectives, leading to liaison between local environment and development non-governmental organizations and environment components within community development projects in urban areas.

52. The preparatory process for major international conferences seems to have the potential for "reaching down" or "breaking through" to the local level and mobilizing non-governmental organization and community support for sustainable development goals, as evidenced by the process leading up to UNCED. The national preparatory process for the second United Nations Conference on Human Settlements (Habitat II), to be held in Turkey in 1996, could be one of another avenue for building up local and national multi-actor coalitions for sustainable human settlements development.

53. The partnerships of United Nations agencies with non-governmental organizations are gradually increasing. The recent trend of direct bilateral funding to non-governmental organizations may increase the potential for more equal partnerships and positive collaboration between United Nations agencies and non-governmental organizations in the pursuit of sustainable human settlement development.

3. Business and industry

54. At the international level, the trade and environment debate has increasingly focused attention on the ways in which environmental legislation can act as "green protectionism". Greater focus is also being placed on competitiveness and environment policy which will have important human settlement implications in the areas of construction materials, recycling and reuse of wastes, energy conservation, and pollution control in the construction sector. An important way forward, and one in which business and industry are already making strides, is internalizing environmental costs through the use of economic instruments and mobilizing financial markets for sustainable development.

55. There appears to be growing activism in some industry sectors as to pollution control, waste management, energy use and water supply. Notable are the activities of the Business Council for Sustainable Development, the World Industry Council for the Environment and the International Network for Environmental Management. These organizations, supported by initiatives of sectoral, industrial and trade associations, especially in the areas of construction, chemicals and tourism, are playing an important role at the international level.

4. Scientific and technological communities

56. Recent scientific and technological developments in such areas as geographical information systems for land resource management, natural hazard assessment and prediction, in the area of resource management and pollution control, and most importantly, the revolutionary advances in information technology, can together lend valuable support in providing for a more sustainable habitat. Agenda 21 has stimulated an extensive debate on the scientific and technological implications of sustainable development among professional bodies world wide. Through this debate, the scientific and technological community is already doing what they do best: disseminating information, creating awareness among the public and policy-makers alike, and stimulating research and development of new technologies through their association in the industry.

D. Capacity-building, technology and finance

1. Capacity-building and technology 11/

57. Efforts related to the transfer of environmentally sound technologies are reviewed in greater detail in the progress report and background papers on chapter 34. Here, a sample of trends and priority areas related to human settlements issues is presented.

58. Available information shows some recent technological trends and potentials that are relevant to the programme areas on sustainable energy and transport systems and a sustainable construction industry.

59. A major development with regard to energy and transport involves increasing commercial availability of renewable energy systems and technologies. In decreasing order, the following technologies appear to be commercially available today: biomass and biogas fuels, solar water heaters, photovoltaic systems, and wind-generated electricity. On the other hand, the following technologies require more efforts in order to increase their commercial availability: biomass-based cooking stoves, solar thermodynamic water pumps, wind energy-based irrigation pumps, and electricity generators and mini/micro-hydro technology.

60. Obstacles to achieving greater energy efficiency are more linked to decision-making (supply or demand side) and to whether efforts have a long-term or short-term perspective than to availability of technologies. Energy efficiency in the context of households needs greater demand-side focus and long-term perspectives.

61. Energy is one of the most costly aspects of the construction process. 12/ Several new technologies that produce cement, steel and glass more efficiently are now available in the public and private domain. But the production of other materials (bricks, tiles and lime) remains highly energy-inefficient in many developing countries, even though more efficient alternatives are available, both in the public and private domain. A number of low-energy materials present great potential for energy saving, including low-energy extenders in partial replacement of cement, stabilized earth construction, and structural use of secondary species of timber.

2. Finance

62. Developing countries invest approximately $150 billion annually in urban infrastructure, excluding investments in housing. This figure is insufficient to accommodate the continuing growth of the urban population and to catch up with the service and infrastructure deficiencies that have accumulated due to the relative neglect of urban investments over the years. The overall cost implications of heightened attention to environmental sustainability of urban growth have yet to be defined. However, forward-looking informative planning and investments are more cost-effective than "upgrading" after the fact.

63. Donor assistance is likely to remain a small portion of the total. The World Bank is planning to finance 150 urban development projects for a total of $15 billion in the period of 1991-1995. The expected doubling of commitments from the current $3.5 billion represents 9 per cent of the Bank's total lending, which was 5 per cent in the preceding five-year period. UNDP's commitments for urban activities varied between 2.8 and 4.7 per cent of total funding commitments from 1987 to 1989. UNDP's commitments in this area are not likely to change. In addition to these financial obstacles, bilateral donors have not yet identified urban development investments as a priority.

III. CONCLUSIONS AND RECOMMENDATIONS FOR ACTION

64. The overall impact of a number of promising activities and new initiatives is not sufficient to deal with the enormous scale of human settlement problems, especially in the developing countries. The explosive growth of urban areas in the developing countries is likely progressively to complicate and exacerbate interrelated problems of human settlements and the environment.

65. The above review and analysis of progress in the implementation of chapter 7 of Agenda 21 has identified some major priority issues, management approaches and delivery strategies for effective implementation of the human settlements programmes of Agenda 21. In considering the recommendations below, it should be kept in mind that they are based on little more than a year's experience in the implementation of Agenda 21.

A. Emerging priority issues

66. Bridging the resource gap. The urbanization trends in developing countries require enormous investments in urban infrastructure and basic services. This places a premium not only on additional external financing but also on effective use of domestic resources. The Commission could consider urging that technical assistance work be channelled into identifying the locally appropriate ways to mobilize domestic resources and discovering untapped sources. This might involve increasing the real value of existing and future investments as well as better management practices, clearer lines of accountability, improved operations and maintenance capabilities and appropriate technologies which can exploit effective demand.

67. Linking technical assistance to capital investment. The Commission might also consider suggesting that technical assistance programmes focus on preparing the ground for capital investment. This might involve broadening the range of actors, beginning with regional development banks, through joint programming and coordination of activities. Such cooperation should be extended to the private financial and business sector. 13/

68. Focusing on the "brown agenda". The Commission might consider drawing the attention of Governments and intergovernmental bodies to the health impacts of urban pollution, collectively referred to as the "brown agenda". Underlying issues in this context involve inappropriate land use, precarious housing, deficient public transportation and road congestion and accidents. Such an approach would also allow for linkages to "human settlements" components of Agenda 21 that are outside chapter 7. 14/

69. Comprehensive approach to urban poverty. The Commission might wish to reiterate the Agenda 21 message on the need for a comprehensive approach that links community economic development and employment generation with the provision of housing, health and other basic services. 15/ The role of the non-governmental sphere, particularly the community organizations, should also be re-emphasized.

70. Balanced implementation of chapter 7. In the follow-up to the review of chapter 7, the Commission might consider urging Governments and intergovernmental bodies to adopt a more balanced approach. Land management and transportation are two programme areas that would benefit from increased agency, private sector and national focus and collaboration.

71. Strengthening the institutions and organizations of civil society. Implementation of Agenda 21 can only be sustained by national and local community organizations and institutions, which remain weak in many developing countries. Institution-building at the local municipal level is thus a particular priority. A number of United Nations agencies have been contributing in this area. 16/ Local authorities and international professional associations have also been active supporters of their counterparts in developing countries. However, there is need for further strengthening and creation of national and regional networks of civil society institutions for greater exchange and sharing of resources. The focus here should be on broad-based and meaningful participation of civil society. In relevant policies, the needs of vulnerable groups should also be given a particular priority.

B. Effective management approaches

72. Strategic interventions. The Commission may wish to consider suggesting cross-cutting issues such as land management as strategic areas for future work.

73. Good governance. Human settlements development, in particular, and sustainable development, in general, require many social, political and economic changes. Legitimacy and compliance with these changes is the basis for successful efforts. The Commission may wish to consider officially recognizing examples of "good governance" (transparency, accountability and participation) at the local level to support these efforts.

74. Strengthening local authorities. Local authorities in many countries are financially and politically dependent on the central government. Efforts to improve the efficiency and responsiveness of urban service delivery by local authorities should go hand in hand with political decentralization and with measures that clarify the lines of responsibility, increase municipal government access to financing for capital investments, and institutionalize systems of accountability for responsiveness to local constituencies.

75. Partnership and collaboration. Partnerships that link the public and private sectors; external, national and local institutions; and public organizations with non-governmental organizations and community groups are essential for sustainable human settlement development. More than simple administrative "coordination", this means an active and interactive collaboration in which the partners share responsibilities, duties, and rewards. The Commission should consider inviting proposals to this end from governmental and non-governmental stakeholders.

76. Building "capacity-for-capacity". Many United Nations agencies have identified capacity-building as a priority for sustainable development. To support this trend and to take it a step further, the Commission may wish to

suggest building "capacity-for-capacity" as the priority. This involves strengthening the capacity of local training institutions for capacity-building in all aspects of human settlement management. Such capacity-building could also include non-governmental organizations and others groups of civil society. 17/

C. Efficient delivery mechanisms

77. Consortium approach. A number of strategic issues, such as the "brown agenda", can serve as an umbrella to implement the objectives of programme areas of chapter 7 cohesively and effectively. The Commission could consider suggesting that consortia of agencies be formed around particular issues for long-term support in implementation.

78. "Best practice" in delivery mechanisms. Trends in best practice favour demand-driven systems, increased networking, "bottom-up" capacity-building, demonstration/replication strategies, regional coordination and decentralized local management. The Commission may wish to request a thorough review of "best practice" applications in human settlements development activities. Such a review might provide a basis for systematic dissemination of effective models.

79. Greater local orientation. Emphasis should be given to delivery mechanisms that allow agencies to work directly with and for local communities and local governments, in genuinely decentralized activities which promote greater development and utilization of local resources. The Commission could recommend that the IACSD focus on such local orientation in coordinating agency activities in sustainable development.

80. Utilization of "Habitat II" opportunities. The second United Nations Conference on Human Settlements will offer an opportunity to raise awareness, coordinate approaches, and marshal support. The Commission should consider the ways in which this forum could be used to focus the attention of all relevant actors and stakeholders on a tightly focused and results-oriented agenda for human settlements follow-up.

Notes

1/ UNCHS (Habitat) is the task manager for chapter 7, per a decision of the Inter-Agency Committee for Sustainable Development (IACSD) at its second session, in 1993.

2/ This total includes both public and private funding. According to the background paper, approximately three fourths of the total ($150 billion) is already being mobilized and invested by developing countries. Bridging the gap will depend on availability of international assistance, which has been shrinking. The working paper suggests that, when available, such assistance should be "strategic and catalytic" for most effective results.

3/ For example, the Sustainable Cities Programme is a joint initiative of UNCHS (Habitat) and UNEP to provide municipal authorities and their partners in

the public, private, and community sectors with an improved environmental planning and management capacity.

4/ An example of World Bank/Habitat cooperation is the co-executing of the Urban Management Programme, which also receives funding from UNDP and a number of bilateral agencies. The Programme concentrates on capacity-building in the areas of urban land management, urban infrastructure management, municipal finance and administration, urban environmental management and urban poverty alleviation.

5/ The Healthy Cities Programme is focused on the management of urban health issues through participatory approaches such as coalition-building at the municipal level and networking among cities.

6/ The area-based programmes approach seeks sustainable social action by combining community participation, empowerment of women, capacity-building and cross-sectoral interventions to improve the condition of children and women in poor rural and urban settlements.

7/ A common and shared vision of urban development was a discussion topic at a recent meeting of the Development Assistance Committee (DAC) of the Organisation for Economic Cooperation and Development (OECD).

8/ Land-sharing involves the negotiation of agreements between landowners and slum dwellers in which the latter gains formal land tenure in return for reduced housing plots. Landowners avoid long eviction cases and gain immediate access to land development.

9/ At the time of drafting of this report, 14 national reports had been received. Their geographical distribution was: six from developed countries, six from developing countries and two from countries in transition. Those that included a specific section on human settlements were mostly from developed countries.

10/ The list includes the following: Confederation of British Industry; Advisory Committee for Business and the Environment; Royal Society for Nature Conservation; National Council for Voluntary Organizations; Committee of Vice-Chancellors and Principals/Council for Environmental Education; Trade Union Congress; the National Alliance of Women's Organizations.

11/ This information is based on a separate report made by UNCHS (Habitat) in response to the request of the secretariat of the Commission on Sustainable Development for information on chapter 34 of Agenda 21 on transfer of environmentally sound technologies, cooperation and capacity-building.

12/ The production of building materials consumes over 75 per cent of the energy used in construction and much of it goes to the manufacture of a small number of high-energy materials such as cement and steel, burnt clay and concrete products, glass and plastics.

13/ The UNDP/UNCHS/UNEP Public/Private Partnership Programme (PPP) proposal with the Business Council for Sustainable Development may be considered as a step in this direction.

14/ For instance, improved infrastructure and services for both small communities and urban centres are a critical part of chapter 6. These issues are also a part of chapters 18-21. A focus under the umbrella of the "brown agenda" could reduce duplicate efforts under these separate chapters.

15/ An existing example in this direction is the Urban Poverty Partnership programme which has recently been initiated by UNDP, UNCHS (Habitat) and the ILO.

16/ UNDP and UNICEF's work with non-governmental organizations, UNIDO's work with the construction industry, WHO's work with the health sector, Habitat's Community Development Programme, focusing on training community leaders, and the World Bank's work on institution-building are examples.

17/ Such an approach has been jointly pioneered by UNCHS (Habitat), the World Bank and UNDP and has begun to open the door to public and private human settlement training institutions in developing countries, linking with others in forms of South-South cooperation for capacity-building.

Annex

SOLID WASTE MANAGEMENT AND SEWAGE-RELATED ISSUES

INTRODUCTION

1. Many of the activities under solid waste management are a subset of the activities under the broader topic of human settlement management. Thus the review and recommendations below should be considered together with the information in the main text reviewing chapter 7.

2. Chapter 21 of Agenda 21 on solid waste management and sewage-related issues comprises four programme areas:

(a) Waste minimization;

(b) Promotion of waste recycling and reuse;

(c) Promoting environmentally sound waste disposal;

(d) Extending waste disposal service coverage.

3. Waste minimization is linked to reducing unsustainable consumption patterns, and as such, requires national level policies. Waste recycling and reuse requires the collaboration of local authorities with the local informal sector, given this area's presence in income-generation potential, particularly in the developing countries. Environmentally sound waste disposal requires the collaboration of local and national authorities, based on appropriate and sustainable legal instruments and their effective implementation. Such legal instruments may need to reconsider the application of the "polluter pays principle" to the case of solid waste management. Waste disposal service coverage is an area of joint programming, with both the formal and informal waste management sectors playing a key role. Efforts in this area need to take into account income-based differences in willingness to pay.

I. GENERAL OVERVIEW

4. Rapid urbanization and the associated growth of industry and services are key features of economic and demographic development in many developing countries. Cities are currently absorbing two thirds of the total population increase throughout the developing world. At this rate 1.9 billion people are estimated to populate the urban areas of developing countries by the year 2000, in addition to the already heavy urbanization level in the developed countries.

5. One of the most important environmental problems of urbanization is the amount of solid waste that is generated, at a rate that outstrips the ability of the natural environment to assimilate it and municipal authorities to manage it. The resulting contamination affects all environmental media and has a direct negative effect on human health and the quality of urban life. Current approaches to solid waste management are by and large, unsustainable.

6. Despite such apparent neglect, solid waste currently consumes a large proportion of most municipal budgets - in some cases, as much as 50 per cent. Efforts to reduce this expenditure would free some municipal funds for other services, such as primary health care, and encourage further development of reuse and recycling techniques that highlight solid waste as a valuable resource.

7. The primary responsibility for solid waste management rests with city authorities who are the single most important actors to implement the activities of chapter 21. Successful outcomes will require the delegation of special responsibilities and financial resources to the local authorities by central governments. This, in many cases, will involve policy changes, legal reform, institutional capacity-building, the use of modern management approaches and appropriate technologies to improve the efficiency and effectiveness of current solid-waste management practices.

8. In many cities of the developed world, solid and liquid waste management is undertaken by the private sector under contract to the local authorities. Similar private-sector involvement also appears to be increasingly the case in developing countries. There are, however, risks related to the infrastructure preceding such privatization. For example, an inefficiently run public service (often the case in waste collection) is susceptible to being replaced by a private monopoly over which the municipal council would have little control. The use of competitive tendering, retaining several different companies for the service needed, and monitoring the contractor's performance might ensure acceptable and effective services.

9. There is much scope for improving the real value of current and future investments made in the formal and informal waste management sector. For example, studies carried out by UNCHS (Habitat), UNDP and the World Bank have shown that highly developed and active informal waste management networks exist, particularly in the developing countries. a/ Similarly, many local authorities and their organizations are taking initiatives to share techniques through partnerships and twinning, to deal with the growing solid waste issue. Encouraging and supportive policies from central governments would assist the efforts of both the formal and the informal solid waste management sectors. I the case of the latter, further support could not only drastically reduce waste collection costs but also improve income-generation and employment opportunities of the urban poor.

II. REVIEW OF PROGRESS ACHIEVED IN THE PROGRAMME AREAS OF CHAPTER 21

A. International cooperation

10. The principal role of United Nations agencies in catalysing action under chapter 21 of Agenda 21 should be to strengthen the indigenous capacities of developing countries to manage wastes, a task that is frequently within the informal sector. The challenge for United Nations agencies is to act as a vehicle for technology transfer among developing countries and to draw the attention of formal waste management authorities to the technological potentials

of the informal sector. Further technology development must adapt indigenous research and development.

11. Several United Nations agencies have been focusing on the management of solid waste. Concern for municipal solid waste management has been a key element of UNEP's human settlements programme. It has organized many training courses on municipal waste management, through its Technology and Environment Branch (TEAB), before the onset of UNCED or Agenda 21. Under the auspices of the Secretariat for the Basel Convention on hazardous waste, UNEP undertook some activities pertinent to municipal waste management. WHO has a similar track record of reporting on technical options for waste management and of organizing regional workshops on a number of specialized topics, including medical waste. WHO is currently cooperating with the International Maritime Organization (IMO) on a global waste survey. The World Bank has been involved in a variety of infrastructure development projects for solid waste management.

12. UNCHS (Habitat) has been actively contributing to related environmental infrastructure issues from the point of view of both research and development and technical cooperation. The activities and projects of the Settlement, Infrastructure and Environment Programme (SIEP) focus on specific areas such as the development of management tools for solid waste, innovative approaches to waste recycling and reuse, and capacity-building through training workshops. UNCHS has also produced computer software for refuse vehicle selection, promoted indigenous technologies, organized international workshops, and expanded its City Data Programme to improve the efficiency and operability of solid waste management in developing country cities.

13. The UNCHS Sustainable Cities Programme (SCP) has assisted in the move towards privatization of solid waste management in selected cities and has established an innovative framework for city consultations leading to improved city management functions.

14. The joint World Bank/UNCHS/UNDP Urban Management Programme is currently preparing publications on private/public partnerships on solid waste management, and regional activities have addressed technical cooperation between developing countries for municipal waste managers. Under the auspices of the joint Panel of Experts on Environmental Management for Vector Control, b/ UNCHS has also been closely involved in activities related to urban disease vectors, especially those relating to waste.

B. Role and initiatives of major groups

15. Many non-governmental organizations in developing countries are playing an increasingly important role in development projects, especially in community-based initiatives where communities prioritize their requirements independently. International agencies have recognized that the execution of projects through non-governmental organizations has many benefits, including cost-effectiveness. United Nations and non-United Nations international agencies should recognize and promote greater non-governmental organization involvement in this area. The private sector is also becoming increasingly

involved in environmental infrastructure, in part driven by the "greening" industry.

III. CONCLUSIONS AND RECOMMENDATIONS FOR ACTION

A. Conclusions

16. Further research on new and indigenous technologies that decrease waste and waste products is needed. A particularly crucial area of research is the treatment of medical waste, involving the collaboration of UNCHS and WHO.

17. Recycling of liquid waste presents various alternatives of "waste to resource" processes. For example, in water-scarce countries, domestic wastewater provides an excellent irrigation potential with extended possibilities for urban poverty alleviation in the urban agricultural environment. Expertise from UNCHS on technical methods for wastewater treatment could combine effectively with the expertise of FAO and WHO on wastewater reuse in agriculture and health-related activities.

18. Good interactive data is an essential management tool in dealing with solid waste problems. The information that exists in the United Nations system and elsewhere needs to be tapped, particularly with the aim of developing indicators that can assist waste producers and handlers to optimize their management systems.

19. Action plans for waste management need to be considered in an integrated manner. For example, the possibilities of implementing separate industrial and domestic wastewater treatment facilities could free more water for irrigation and enable water authorities to maintain a tighter control over highly polluting industries. Cooperation with FAO, UNEP and UNIDO in this respect is most important.

20. Legislative updating is also an urgent need, given that in many countries waste treatment/disposal standards and practices for waste treatment and disposal tend to be outdated. Cooperation between UNCHS and other United Nations agencies with programmes in environmental law could help to reduce restrictive legal practices and modernize the related environmental standards.

21. Such inter-agency collaboration will require greater exchange of information between the agencies, including the use of electronic media. The use of modern information systems is likely to improve project development and strengthen inter-agency projects. Further collaboration is also needed in coordinating activities at the national level in order to avoid unnecessary duplication.

B. Recommendations

22. Promote increased synergy between the formal and informal sectors. Despite the significant role of the informal sector in solid waste management, there are few attempts to capitalize on its potential. United Nations organizations

should assist municipal authorities to recognize and integrate the potential of the informal sector.

23. Promote greater awareness of environmental and health risks from poor solid waste management. Applied research shows that the methods of waste disposal that have been used over the past decades have caused death and disability to many. Greater awareness of solid waste issues are likely to influence consumption patterns and improve the application of sustainable policies. The increasing amount of hazardous materials in domestic waste should be given a higher profile.

24. Promote the development and use of indigenous technologies. Many developing countries are dependent on imported technologies for infrastructure improvements, including those in waste management. This requires high initial capital investment, which then reduces the private investment potential. Yet, many of the most appropriate technologies are available locally in forms that can be easily and cheaply adapted to the relevant needs. This points to greater potential for technical cooperation - including regional and international cooperation - between developing countries.

25. Focus on strategic programme areas. The programme areas on the promotion of waste recycling and reuse and on increasing service coverage appear to offer the most promise for the short-term implementation of Agenda 21. This is, in part, because these areas offer good opportunities for community-based initiatives. The promotion of waste recycling and reuse provides a unique opportunity in waste management; it solves the problem of environmental degradation and has the potential to alleviate urban poverty and generate income among the urban poor. Success will, however, require supply-side policies aimed at promoting and supporting resource recovery and demand-side policies aimed at stimulating markets for recovered materials and products.

26. Promote information systems that can accelerate the implementation of Agenda 21. The implementation of Agenda 21 in sustainable development can be improved by a major commitment to inter-agency cooperation. Unlike non-governmental organizations, the private sector, academia and research institutions, the agencies have been hindered by lack of information systems that are responsive and non-restrictive.

Notes

a/ "Informal sector" in solid waste management is a reference to the [mostly urban] poor who make a living from scavenging waste dumps or collecting reusable household or small business waste for reuse by local manufacturers. It, in effect, functions as a micro-enterprise. Despite its apparent low cultural status, the informal sector in waste management in developing countries has been instrumental in recycling a range of materials such as glass, metal, paper, and aluminium, long before recycling became the centrepiece of urban waste management policies in developed countries. More recently, the concept appears to also include community voluntary initiatives to deal with local solid waste problems, particularly when a formal system does not exist or is insufficient.

b/ The Panel includes WHO, FAO, UNEP and UNCHS (Habitat).

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REVIEW OF SECTORAL CLUSTERS: FIRST PHASE: TOXIC CHEMICALS AND HAZARDOUS WASTES

Toxic chemicals

Report of the Secretary-General

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INTRODUCTION

1. In its decision 1993/314 on 29 July 1993 the Economic and Social Council approved the provisional agenda for the second session of the Commission on Sustainable Development which, in item 6 (b), provided for a review of sectoral clusters, first phase: toxic chemicals and hazardous wastes.

2. In thematic reports such as this, corresponding to the Agenda 21 sectoral clusters, the Commission requested the Secretary-General to include, inter alia, information on the main activities that countries are undertaking or planning. In order to give the Secretariat sufficient time to analyse the information received, the Commission urged Governments to submit their reports not less than six months prior to the Commission's sessions (E/1993/24, Add.1). Unfortunately the Secretariat had received only a few national reports at the time of the preparation of the present report. It is based, therefore, mostly on information available within the United Nations system.

I. GENERAL OVERVIEW

3. Almost 11 million naturally occurring or man-made chemicals have been identified. 1/ About 100,000 chemicals are currently produced on a commercial basis, with 1,500 chemicals, however, accounting for 95 per cent of world chemical production. Approximately 1,000 new chemical substances enter the market every year.

4. The world chemical industry has experienced phenomenal growth during the past four decades. Worldwide sales reached $1,206 billion in 1991, with petrochemicals having the largest share, of about 40 per cent. In the same year, the chemical industry accounted for 7 per cent of global GDP and 9 per cent of international trade. The main geographical markets and production bases are Western Europe, the United States and Japan, which together account for 90 per cent of world sales and output. 2/

5. The trend in chemical and material development, principally in industrial countries, is increasingly towards more complex products such as powder alloys, composites, ceramics and hybrid materials. An increase in the use of chemicals can be foreseen in the food, pharmaceutical, engineering and construction industries.

6. However, in the paint, glue, chemical engineering, metal manufacturing and laundry and dry cleaning industries, one can already see a shift towards simplicity and water-based systems, often due to environmental concerns, at least in some regions. 3/ Increased specialization in the industry, leading to more international trade, and a shift of more chemical production to developing countries, are expected.

7. The widespread and growing use of chemicals in all sectors has been accompanied by accumulating evidence of their adverse effects, including pollution of land, water, oceans and the atmosphere. The chemical industry has developed without sufficient knowledge and consideration of its impact on human

health and the environment, especially with regard to long-term risks. Dramatic occurrences such as the industrial discharge of mercury in Minamata, Japan, which poisoned thousands of people, and the leak from a pesticides factory in Bhopal, India, which killed more than 2,000 people and blinded or injured 200,000 more, have made the risks increasingly apparent. Control measures were often initiated only after the accidents had occurred. A precautionary principle was, in general, not applied - that is, chemicals were not examined for health and environmental risk before entering their production, use and waste disposal cycles. If a risk assessment was made, it was mostly with a risk to human health in mind. The additional aspect of risk to the environment is a fairly recent consideration, and methods for its assessment are still in the initial stages of development. 4/

8. Because of the trend in the world chemical industry towards more complex products, exposure and risks are bound to increase at all stages of production, transportation, storage and use. This is particularly so in the use of pesticides and fertilizers in the agricultural sector where the capabilities for safe use are very limited. Pesticides, which are toxic by nature, pose particular problems.

II. REVIEW OF PROGRESS ACHIEVED IN THE PROGRAMME AREAS OF CHAPTER 19 OF AGENDA 21

A. International cooperation

9. In chapter 19 of Agenda 21, entitled Environmentally sound management of toxic chemicals, including prevention of illegal international traffic in toxic and dangerous products, the United Nations Conference on Environment and Development (UNCED) emphasized that a substantial use of chemicals is essential to meet the social and economic goals of the world community and that today's best practice demonstrates that they can be used widely in a cost-effective manner and with a high degree of safety. However, a great deal remains to be done to ensure the environmentally sound management of toxic chemicals, within the principles of sustainable development and improved quality of life for humankind. Two of the major problems, particularly in developing countries, are lack of sufficient scientific information for the assessment of risks entailed by the use of a great number of chemicals, and lack of resources for the assessment of chemicals for which data are at hand. UNCED further emphasized that gross chemical contamination, with grave damage to human health, genetic structures, reproductive outcomes, and the environment, continues to exist in some of the world's most important industrial areas. Restoration will require major investment and the development of new techniques. The long-range effects of pollution, on even the fundamental chemical and physical processes of the Earth's atmosphere and climate, and the importance of those effects are only beginning to be understood. UNCED recognized that a considerable number of international bodies are involved in work on chemical safety. In many countries work programmes for the promotion of chemical safety are in place. Such work has international implications, since chemical risks do not respect national boundaries. However, a significant strengthening of both national and international efforts is needed in order to achieve an environmentally sound management of chemicals.

10. In this context UNCED approved six programme areas for action at the national and international levels:

(a) Expanding and accelerating international assessment of chemical risks;

(b) Harmonization of classification and labelling of chemicals;

(c) Information exchange on toxic chemicals and chemical risks;

(d) Establishment of risk reduction programmes;

(e) Strengthening of national capabilities and capacities for management of chemicals;

(f) Prevention of illegal international traffic in toxic and dangerous products.

11. Unfortunately only a small number of reports were submitted by Governments on progress made in the implementation of the six programmes. Consequently the scope of the present report is limited, and a considered assessment of progress made can be attempted only when much more information is submitted on country experiences. However, the United Nations Environment Programme, as task manager, submitted a comprehensive report on the activities of the United Nations system and other multilateral organizations. The rest of this section, therefore, describes mainly the activities of the United Nations system in the implementation of the programmes and concludes with an outline of new initiatives for their accelerated implementation.

1. Expanding and accelerating international assessment of chemical risks

12. Data on the properties of and exposure to a chemical are required before a chemical risk assessment can be conducted. Such data are provided primarily by industry, government and private-sector research institutions. In order to achieve international acceptance, data quality and test method harmonization are important. Of particular note are the activities of the Organisation for Economic Cooperation and Development (OECD), the International Programme on Chemical Safety (IPCS), a joint programme of the International Labour Organization (ILO), UNEP and the World Health Organization (WHO)) and the United Nations Committee of Experts on the Transport of Dangerous Goods (UN/CETDG). OECD and the European Union (EU) have taken significant steps to encourage industry to generate and provide data of good quality on which to base chemical risk assessments.

13. Chemical hazards and risks have been assessed, and guideline limits for exposure have been produced by international organizations for many years. While several types of international assessments are available, IPCS environmental health criteria documents are the most comprehensive and authoritative toxicological evaluations of chemicals. The production of such evaluations is a resource-intensive activity. At present IPCS produces an

average of 14 environmental health criteria documents a year. The time-frame for producing such a document is at least two years.

14. Publication of a document on scientific principles for the assessment and characterization of risks to human health associated with chemical exposure and on the derivation of guidance values for health-based exposure limits is anticipated in 1994. Another initiative of IPCS is to rationalize the world-wide production and acceptability of criteria documents which describe toxic hazards and risks. As part of this initiative, UNEP's International Register of Potentially Toxic Chemicals (IRPTC) and the European Chemical Industry Ecology and Toxicology Centre (ECETOC) are producing an inventory of all criteria documents planned, in preparation, or published. IPCS has, in addition, recently undertaken, in cooperation with OECD, a project aimed at harmonizing approaches used by countries or groups of countries in toxicological risk assessment. OECD, with UNEP, is mainly responsible for the development of methodologies to assess environmental hazards and exposure, whereas IPCS is mainly responsible for the development of methodologies that assess effects on human health.

15. Toxicological evaluations of pesticide residues in food have also been carried out by the FAO/WHO's Joint Meeting on Pesticide Residues (JMPR), and additives, contaminants and the residues of veterinary drugs in food have been studied by the FAO/WHO's Joint Expert Committee on Food Additives (JECFA), which also produces evaluations used as a basis for recommendations by the Codex Alimentarius Commission. The scope of JMPR - to be renamed the Joint Meeting on Pesticides (JMP) - will be widened in 1994 to include consideration of public health, occupational health and environmental concerns. A number of organizations have embarked on new initiatives to address the risk assessment of pesticides. OECD has a newly established Pesticides Activity, with a major workshop planned to review progress in environmental assessment. A EU directive concerning the placing of plant-protection products on the market became effective in 1993. The directive is supported by guidelines and criteria for evaluating pesticides.

16. The International Agency for Research on Cancer (IARC), OECD with its toxicological assessments of high production volume chemicals, the Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP) and WHO are also active in risk assessment and provide guidelines for exposure to chemicals as they relate to each expert's sphere of interest. Air-quality guidelines are being updated by WHO's Regional Office for Europe and will be further evaluated with relevance to global air quality standards in collaboration with IPCS and EU.

17. Risk assessment methodologies are published by several organizations - e.g., OECD, ILO and IPCS. Chemicals often need to be prioritized for risk assessment. This has been done mainly on the basis of hazard potential and/or exposure potential by, for example, IPCS, UNEP, OECD and EU.

18. In 1993, EU adopted a directive containing general principles for the assessment of risks posed by new substances to workers, consumers, the general public and the environment, and the EU Regulation on the Evaluation and Control of the Risks of Existing Substances came into force. The Regulation foresees

the collection of data, in a harmonized electronic format, for over 10,000 substances during the period 1994-1998 and storage of that data on the EUCLID database. Detailed risk assessments will be conducted on priority substances.

2. Harmonization of classification and labelling of chemicals

19. International initiatives in the area of harmonization of classification and labelling of chemicals started a few years before UNCED. Following a 1989 International Labour Conference resolution, ILO, in consultation with a number of international, regional and national bodies concerned with the classification and labelling of chemicals, initiated action to ensure the establishment of a globally harmonized system and issued a report assessing the magnitude of the task. The report (1992) indicated that four major existing systems should be used as a basis for establishing a harmonized global classification and labelling system. The systems are: the United Nations Recommendations on the Transport of Dangerous Goods (RTDG); EU directive 67/548/EEC, as amended for the seventh time (92/32/EEC), on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances; the combined system Toxic Substances Control Act/Hazard Communication Rule in the United States of America; and the combined system Workplace Hazardous Materials Information System/Environmental Protection Act in Canada.

20. The United Nations Recommendations were developed by the United Nations Committee of Experts on the Transport of Dangerous Goods, which is serviced by the Economic Commission for Europe (ECE). They have been used as a basis for national and international transport regulations/instruments for various modes of transport. There is close cooperation among international transport organizations in this area.

21. In 1991/92 an OECD clearing-house led by EU, Sweden and the United States was established to undertake harmonization of classification criteria for acute oral, dermal and inhalation toxicity and hazard to the environment. The overall perception seems to be that these proposals are an acceptable basis for further negotiation and that the impact of expected changes in different systems, including the United Nations Recommendations, although not negligible, would be manageable. The OECD clearing-house also elaborated proposals for harmonized criteria for aquatic toxicity based on those developed in the EU and the Nordic countries. It also made preparations for developing criteria for the soil/terrestrial environment. OECD is preparing work plans to consider harmonization of criteria for categories such as long-term toxic, irritant, sensitizer, carcinogen, mutagen and toxic to reproduction. Preliminary work, at the level of national expert, has started on the categories of carcinogen and toxic to reproduction.

22. In 1992 the IPCS Coordinating Group for the Harmonization of Chemical Classification Systems was established, with ILO providing the secretariat. The Group is an informal forum for interested national, regional and international bodies and organizations, including those representing the interests of workers, employers, industries, and bodies concerned with consumer and environmental protection. It has agreed that OECD will be the focal point for harmonization

of all human health and environmental effects. ILO will be the focal point for harmonization of physical hazards of chemicals and for hazard communication - i.e., labelling and chemical safety data sheets.

23. Other international activities of relevance to this programme area are those undertaken in relation to the implementation of the ILO Chemicals Convention (1990) at the national level, FAO guidelines on good labelling practices for pesticides, the peer-reviewed International Chemical Safety Cards of IPCS, and the elaboration of test methods by OECD and the United Nations Committee of Experts. The International Occupational Safety and Health Information Centre of ILO (ILO/CIS) has started to elaborate work plans for the harmonization of hazard communication. In addition, IPCS and ILO/CIS have conducted a preliminary analysis of phraseology used in chemical safety data sheets.

3. Information exchange on toxic chemicals and chemical risks

24. Information exchange on toxic chemicals and chemical risks is the task of most international organizations and programmes involved in the promotion of chemical safety. Many varieties of information are available from United Nations bodies/programmes and other international organizations, some of them mentioned above. IPCS also produces poison information monographs and a computerized information package, called INTOX, for use by poisons information centres. ILO/CIS has collected and disseminated, with the aid of nearly 70 national centres, technical and legal information on occupational health and safety. UNIDO is planning to set up a global chemical safety information network for both chemical and pesticide production in developing countries, particularly aimed at small and medium-sized operations.

25. UNEP/IRPTC carries data profiles relevant to the assessment of hazards and risks posed by chemical substances to human health and the environment, waste management, and legal information on national and international regulatory control measures. IRPTC also maintains a data bank to manage and implement the London Guidelines and the Prior Informed Consent (PIC) procedure. IRPTC is currently working on having in its network more active participation from other information systems. It also intends to revise its strategy for the selection of data and plans to establish, in cooperation with IPCS, expert panels to validate the quality of information contained in its system. The resulting validated data sets are intended to provide a source of basic data of internationally recognized quality which are needed for assessing chemical risks in both national and international forums. It is expected that these validated data sets will facilitate mutual acceptance of risk assessments among concerned groups and organizations.

26. The IRPTC chemical identity file is being expanded to assist developing countries to set up their own national inventories of manufactured and imported chemicals. IRPTC is also preparing to act as a repository of OECD Screening Information Data Set dossiers to allow distribution to non-OECD countries. IPCS, ILO/CIS and UNEP/IRPTC are preparing a "United Nations" CD-ROM to include a number of databases on chemical safety information. The United Nations prepared, with UNEP/IRPTC and WHO, the Consolidated List of Products Whose

Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or Not Approved. The list includes all relevant information collected and disseminated by the United Nations system and is mandated and reviewed by the General Assembly.

27. A number of mechanisms for disseminating information have been developed - for example, the London Guidelines for the Exchange of Information on Chemicals in International Trade, adopted by UNEP in 1987. The Guidelines, which are voluntary, provide a mechanism for Governments to share scientific, technical, economic and legal information and thereby increase chemical safety. They were amended in 1989 to incorporate the PIC procedure. The PIC procedure has also been incorporated in the FAO International Code of Conduct on the Distribution and Use of Pesticides. UNEP and FAO have established a joint programme providing operational assistance to Governments, particularly those of developing countries, in implementing the PIC procedure. Training and technical advice are organized jointly with UNITAR. UNEP has established a task force to consider modalities for a legally binding instrument on the mandatory application of the PIC procedure. A set of elements that might be included in such an instrument have been identified and will be further elaborated in 1994.

4. Establishment of risk reduction programmes

28. Chemical risk reduction programmes include fundamental arrangements such as chemical safety legislation and enforcement and adequate labelling, responsible care and stewardship by industry. The establishment and implementation of the PIC procedure provides an immediate way to reduce the risk posed by chemicals banned or severely restricted in one or more countries.

29. The reduction of chemical risks in food is addressed in the Codex Alimentarius Commission recommendations of acceptable daily intakes in food and maximum residue levels in crops. The recommendations serve as guidelines for many countries in their regulatory work on food safety. In the reduction of pesticide risks, FAO has been active through the adoption of an International Code of Conduct on the Distribution and Use Of Pesticides, which represents a wide consensus on pesticide management among Governments, industry and non-governmental organizations. FAO is preparing to review the implementation of the Code. FAO and UNEP have assisted developing countries in the implementation of integrated pest management and also jointly co-sponsor the Panel of Experts on Integrated Pest Control in Agriculture. FAO/UNEP/WHO are collaborating on a project to publish guidelines on the treatment and disposal of bulk and small quantities of pesticide waste aimed especially for developing countries. OECD intends to use the results of a recent survey of pesticide risk reduction activities in member countries as a basis for setting priorities for future work. There is a proposal for a EU biocides directive, which will establish a list of approved active ingredients in non-agricultural pesticides, and will complement an existing directive on plant protection products. Some countries have found that attaching a high cost to re-registering older pesticides has removed the higher risk chemicals from the market.

30. WHO is promoting the application of health-based guideline values for chemicals in air and water through its regional offices. ILO formulates

policies and programmes to help improve working conditions with respect to chemicals and produces international labour standards to serve as guidelines to national authorities in putting these risk reduction policies into action.

31. An important way to achieve risk reduction is to adopt cleaner production methods and a life-cycle approach to assessing and handling chemicals. UNEP operates a database providing information on cleaner production technologies and products. UNIDO and UNEP intend to increase their involvement in providing information on cleaner production, with UNEP establishing regional centres for the application of cleaner technologies. In the ECE recommendations on reduction, replacement, recovery, recycling and re-utilization of industrial products, residues or waste (1992), due consideration is given to the substitution of hazardous substances by less dangerous or non-hazardous ones with respect to possible health and environmental effects throughout all stages of the commercial life of a chemical.

32. The United Nations RTDG address not only classification and labelling but also requirements for packing, multimodal tank transport and consignment procedures. They are reflected in numerous national regulations and in a number of international instruments, including the International Maritime Dangerous Goods Code (under the auspices of IMO) and the European Agreement concerning International Carriage of Dangerous Goods by Road (under the auspices of ECE). They also influence emergency response approaches.

33. Phasing out of chloro-fluorocarbons (CFCs) is addressed by the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer, as amended. This example of a global risk reduction programme is in operation. It was initiated by UNEP.

34. OECD has developed an international cooperative risk reduction programme. A small number of substances (lead, cadmium, mercury, methylene chloride and brominated flame retardants) have been selected by OECD member countries for a pilot risk reduction project. The programme has been expanded to cover risk prevention in close cooperation with the pollution prevention and control programme. A number of new approaches will be explored, such as the use of pollutant release and transfer registers. Another focus will be to develop practical approaches to substances that have similar structure, use, hazardous properties or manufacturing processes.

35. There has been much activity by international organizations in addressing ways to prevent or respond to major chemical accidents at fixed installations. A key initiative was the EU directive on the major accident hazards of certain industrial activities. The directive, commonly known as the "Seveso" directive, was adopted in 1982. EU plans shortly to make a proposal to review the directive fundamentally and increase its scope.

36. ILO published a manual on major hazard control in 1988 and a Code of Practice on the Prevention of Major Industrial Accidents in 1991. The ILO Convention and Recommendation on the Prevention of Major Industrial Accidents were adopted in 1993.

37. Another key initiative is UNEP's Awareness and Preparedness for Emergencies at Local Level (APELL) Programme. It was launched in 1988, in cooperation with Governments and industry. Its main goal is to prevent technological accidents and reduce the impact of those that occur by assisting decision makers and technical personnel to increase community awareness of hazardous installations and to prepare response plans in case of unexpected events. UNEP is currently working with IMO to develop specific activities on the prevention of accidents in ports. UNEP, also within the framework of APELL and together with IPCS, WHO/EURO and OECD, has produced guidelines on the role of the health sector in chemical emergency preparedness and response. They will be used by IPCS and WHO regional offices in training activities. Case studies of successful APELL implementations will be published in 1994.

38. Recent initiatives in the prevention of chemical accidents include the 1992 ECE Convention on the Transboundary Effects of Industrial Accidents, which fostered regional cooperation concerning research and development, exchange of information and exchange of safe technologies, and OECD's comprehensive Guiding Principles for Accident Prevention, Preparedness and Response, which was published in 1993. OECD is currently working on extending the scope of its Guiding Principles, including the interface between fixed installations and various transport modes.

39. IPCS has four main projects to support national poison control programmes which, through a worldwide network of poison information centres and related medical and analytical toxicology facilities, provide information on a 24-hour basis. IPCS plans to study the epidemiology of pesticide poisonings in various parts of the world, with a view to reducing them. A Centre on Health Aspects of Chemical Accidents is being established in the Netherlands, in collaboration with WHO. IPCS is expanding its INTOX project to enhance chemical incident response and reporting and environmental health monitoring. Through a WHO European regional office project, in collaboration with IPCS, networking among centres for toxic alerts is being developed.

40. UNCED proposed that industry should develop an international code of principles for management of trade in chemicals, particularly with respect to their disposal. UNEP has been requested by its governing council to provide an international forum for consultation with private-sector parties on the preparation of a code of ethics on the international trade in chemicals. In 1992-1993 UNEP convened meetings with industry and other private-sector parties, international organizations and government experts. A final text for a code of ethics is expected to be developed in April 1994.

41. With the assistance of national and international organizations such as OECD and UNITAR, IPCS has been coordinating activities to facilitate the establishment of pollutant release and transfer registers (referred to as "emission inventories" in Agenda 21) as a risk reduction tool. In a separate but related activity, an ECE emission inventory guidebook for air pollutants will be developed by 1995, in collaboration with EU. Toxic release inventories, requiring industry to make an accounting of their toxic releases into the environment as part of community-right-to-know programmes, have led to voluntary clean-up in some countries - e.g., the United States of America.

5. Strengthening of national capabilities and capacities for management of chemicals

42. Most developed countries have at least some systems in place for the environmentally sound management of chemicals. In many developing countries and countries in transition, such systems are very limited or non-existent. The establishment and strengthening of such systems and institutions at the national and regional level in the developing world is needed.

43. Concern with insufficient control of chemicals prompted UNEP, in 1987, to adopt the London Guidelines for the Exchange of Information on Chemicals in International Trade, as described above. UNEP has developed training and technical assistance programmes in cooperation with other international organizations for the application of its legislative guidance documents on chemicals management in developing countries. The United Nations RTDG provide a sound basis for development of national legislation on the transport of dangerous chemicals. International policies and standards regarding the safety of chemicals at work are formulated by ILO. Standards are defined in conventions and recommendations which provide a model and stimulus for national legislation and practice in member States. ILO helps developing countries to establish or strengthen national frameworks so that they can eventually ratify ILO instruments. In the context of its new "active partnership policy", ILO is establishing, in key regions, multidisciplinary teams of ILO experts to assist in evaluating national occupational health and safety needs, including chemical safety requirements.

44. One of the objectives of IPCS is to improve the capabilities of national authorities to conduct their own evaluations of health and environmental hazards and risks from chemicals. Training courses have been conducted for senior decision makers and carefully chosen professionals. However, insufficient resources have precluded any large-scale training programme. IPCS provides comprehensive sets of tools for increasing the capacity of countries to deal effectively with poisonings, including guidelines on setting up and operating poison control centres and a handbook on recognizing poisoning and first aid measures. IPCS is preparing guidelines on the administrative and other structures needed to strengthen national chemical safety programmes.

45. WHO regional offices and IRPTC also run training courses in hazard and risk assessment, and IRPTC furthermore assists countries in establishing national chemical information centres. ECE encourages the implementation of OECD risk assessment practices by non-OECD members of the ECE region. Some countries in transition reported a particular need to boost their laboratories so as to be able to comply with guidelines. A slow phase-in method was reported to be working well in one transition economy, requiring compliance in the pharmaceutical industry first.

46. United Nations agencies and programmes, such as ILO, IMO, UNEP, WHO, UNIDO, IPCS and the United Nations Development Programme (UNDP) organize chemical safety training for developing countries. For example, UNIDO pays particular attention to training in the safe formulation and application of pesticides and has published safety guidelines. IPCS and ILO seek to train a country's trainers. ILO provides specific safety training to labour inspectorates.

47. The United Nations Centre for Urgent Environmental Assistance, which is an experimental programme of UNEP, is exploring ways to enhance existing international capacities for responding to emergencies with environmental consequences. Certain developing countries, such as Sri Lanka, have, with the assistance of international organizations, surveyed hazardous industries and their preparedness for emergencies by drawing up programmes for institutional strengthening.

48. ECE assists countries in economic transition in the clean-up of chemical waste sites. OECD's Development Assistance Committee recently adopted a number of guidelines on aid and environment which include guidance for the management of chemicals. UNITAR, in cooperation with IPCS and its cooperating organizations, has started work on an inventory of training assistance activities organized by international organizations in the field of chemical safety.

6. Prevention of illegal international traffic in toxic and dangerous products

49. The major United Nations activities relevant to the prevention of illegal international traffic in toxic and dangerous products are the London Guidelines, including its PIC procedure, which are also incorporated into the FAO International Code of Conduct on the Distribution and Safe Use of Pesticides, and the Consolidated List of Products Whose Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or Not Approved. Activities to strengthen national capabilities for the management of chemicals contribute to the reduction and/or prevention of such traffic.

50. The Economic and Social Commission for Asia and the Pacific (ESCAP) has been conducting a preliminary assessment of illegal traffic in toxic and dangerous products and wastes. ESCAP and the Economic and Social Commission for Western Asia (ESCWA) are planning to address the development of appropriate legislation.

7. New initiatives

51. The following new initiatives, critical for the environmentally sound management of chemicals and the implementation of chapter 19 of Agenda 21, have been taken by the United Nations system and multilateral organizations since UNCED:

(a) A strengthened and enhanced IPCS is being developed by the international community to promote coordination and cooperation among international organizations, including OECD, in the field of chemical safety, in line with earlier recommendations from a government-designated expert meeting;

(b) The establishment of an intergovernmental forum on chemical safety, to enable Governments to develop strategies, foster an understanding of issues related to the environmentally sound management of chemicals, and provide policy guidance at the intergovernmental level, will be discussed at the International

Conference on Chemical Safety, to be held in Stockholm, Sweden, 25-29 April 1994;

(c) A programme on sustainable economic and ecological development in the chemical industry in economies in transition has been launched by ECE;

(d) UNEP has evaluated the need for and possible elements of an internationally legally binding instrument concerning the PIC procedure.

B. Country experiences

52. In the developed world the Nordic countries have long-established cooperation mechanisms among themselves in the area of chemical control, and negotiations are under way for harmonizing legislation and guidelines with those of the EU countries. In some cases legislation has already been amended to comply with EU directives. OECD is another forum where the Nordic countries actively participate in the programme of rational distribution of work among members in order to avoid overlapping in chemical risk assessment. Finland and Norway have taken on two chemicals each for risk assessment in the high production volume chemicals programme of OECD. Exporters of banned or severely restricted chemicals have to inform the authorities not only in the importing country but also in their home countries before export (e.g., Finland). The Nordic chemical industry has embraced the "responsible care" programme and in Norway, at least, the chemical industry has demonstrated willingness to comply with EU regulations even before they are incorporated into domestic legislation.

53. One concern often voiced is the jurisdiction of so many different departments and ministries and the need to coordinate policies at the national level. Some Nordic countries have taken a very active role in the harmonization of classification and labelling work at the international level, with Sweden, together with the United States and EU, leading the work in OECD on acute health effects and environmental impacts, and Norway and the Netherlands acting as a clearing-house for the harmonization of classification of carcinogens.

54. Canada conducts many of its efforts with regard to research, the exchange of information and risk reduction of toxic chemicals within the multilateral programmes of OECD and ECE. Canada's policies are moving towards prevention rather than a "react and cure" model. This is embodied in voluntary programmes by industry, governmental legislation and economic incentives. The Federal Canadian Environmental Protection Act (CEPA) provides a tool for managing chemicals at each stage of the life cycle. The Federal Government has established the Domestic Substances List, containing substances used in Canada between 1984-1986. Any substance that is not on this list must be assessed prior to being manufactured or imported into Canada. There is a substantial federal effort being made to conduct environmental and health assessments for up to 100 priority chemicals by the year 2000. Canada has also established the National Pollutant Release Inventory, requiring companies to collect information on the release of specified substances into air, water and land. This information will be made available to the public. Risk reduction programmes have been established through the Green Plan which, inter alia, requires a 50 per cent reduction in sulphur dioxide emissions in eastern Canada by 1994.

55. Industry in Canada has developed its own guidelines and codes of practice involving toxic chemicals. It initiated the National Emission Reduction Master Plan, a voluntary approach to collecting release information. The Industrial Accidents Council of Canada develops guidance in chemical emergency prevention, preparedness and response. Partnerships between industry, Governments and other major groups, through voluntary action, seek the elimination or phase-out of bio-accumulative, persistent toxic substances.

56. The United States of America, being a major producer and consumer of chemicals, has an array of chemical-control programmes based in part on the Toxic Substances Control Act and the Federal Insecticide, Fungicide and Rodenticide Act. The United States has found that it makes sense to approach the control of pesticides one at a time. Each producer most prove conclusively that the pesticide will not cause unacceptable risks to human health or the environment before it is used. However, this approach has not proved successful in reducing risks for other chemicals and, consequently, the United States is looking at measures other than "command and control". It reports that its most important innovation in chemicals management in the past 10 years has derived from the Emergency Planning and Community Right-to-Know Act. Under that Act, local and State committees develop plans to prevent, prepare for and respond to chemical accidents. The Act also established inventories of the annual emissions of 300 toxic chemicals. Since companies must account for their emissions and make the information available to the public, the Act has put pressure on them to reduce their emission levels and identify wasteful processes. Using the inventory data as a baseline, about 2,000 companies have voluntarily agreed to reduce their releases of 17 priority chemicals by 33 per cent in 1993 and by 55 per cent in 1995. (The 33 per cent goal was achieved in 1992.) Even if voluntary measures cannot replace altogether a solid regulatory framework, the United States has found that public accountability, pollution prevention, voluntary programmes and economic incentives are successful because of their flexibility, timeliness and efficiency. Industry in the United States also subscribes to the "responsible care" principles, as a prerequisite for membership in industry associations. Consumer labelling is another way of creating market pressures on producers of chemicals to provide environmentally and health-friendly products. The United States is also involved in innovative approaches to risk reduction such as an evaluation of different alternatives to production in particular industries such as printing and dry cleaning. These approaches consider the impact of products and processes on workers, the public and the environment and then build into the design phase of the production cycle a comprehensive approach to achieve the lowest economically feasible risk. The United States is a leading country in many international activities in this area, such as harmonization, emergency planning and information exchange. It indicates that appropriate import controls are very effective in controlling illegal traffic in toxic chemicals.

57. The Netherlands has decided that, as a national objective, the maximum permissible chemical risk level for the public and the environment must not be exceeded by the year 2000. The Netherlands has made a significant contribution to the work of EU and OECD in this area by taking responsibility for evaluating the risk of seven chemicals.

58. Countries in transition in Central and Eastern Europe have been trying to align their legislation and guidelines as regards chemicals with those of EU and OECD. Since this involves considerable financial and trained human resources, prioritization has been essential. In Hungary this has led to prioritizing chemical safety and testing practices in the pharmaceutical industry. The environmental impact of chemicals is also being introduced into new legal frameworks. However, the national capacity to assess such impacts and risks is limited. In the Czech Republic a network of specialized laboratories has been formed, some of which are equipped with modern apparatus to perform chemical analysis using internationally approved methods. Control over the transportation of toxic chemicals is in many cases insufficient.

59. Most developing countries have limited or no capacities at all in this area. However, a few have reported some progress. Some countries are in the position to participate effectively in the "prior informed consent" procedure and other risk-reduction and assessment programmes and have established focal points staffed with appropriately trained personnel. Sri Lanka now has a complete inventory of chemicals used within its borders and has computerized data on the risk entailed in their use, relying on, among others, United Nations-system information sources. Sri Lanka has introduced a risk-reduction programme as well, beginning with a survey of the state of preparedness of industries with potentially hazardous processes and the planning of institutional strengthening in the area of emergency preparedness. The Republic of Korea has a Toxic Chemicals Control Act which requires risk assessment and annual registration of certain chemicals before manufacturing and importation.

60. The planning of chemical control, prevention and risk reduction measures has not kept pace with accelerated industrialization in many developing countries. Some chemical industries in developing countries emit significant quantities of pollutants into the sea and air, and small industries often emit untreated liquids into important waterways. In Tunisia, for example, some plants situated close to human dwellings have had to be closed because of the effects of pollution. In other cases important industries are prioritized for control measures, such as the oil industry in Myanmar and the mining and metallurgical industry in Bolivia.

61. Some developing countries have reported that the cost of cleaning up existing production processes is often prohibitive. Therefore, cleaner production in new installations is seen as the most cost-effective route to a less polluted future.

C. Technology and finance

1. Technology

62. Because of the magnitude of the adverse impacts of toxic chemicals on human health and the environment, as emphasized by UNCED in chapter 19, the concept of clean technologies which call for a shift from "end-of-pipe" solutions to environmental protection at the very source of production is particularly important in the developing countries, since those countries do not have adequate capacities for the effective control of toxic chemicals. Neither do

they have the capability to respond effectively to serious accidents or to monitor long-term environmental effects. Consequently policies favouring prevention rather than expensive clean-up should be preferred there. Appropriate technology standards should be developed with regard to investments from both indigenous and outside sources, including transnational corporations.

63. UNIDO has indicated that for the developing countries, the potentials arising from innovations in cleaner technologies are important, since those countries will be adding significantly to their capital stock. Ten years hence, new plants and equipment will account for more than one half of the industrial output of the developing countries. Many of them currently have a disproportionately high level of old, inefficient and pollution-intensive capital stock in all sectors, partly due to low growth in the 1980s, which resulted in low turnover of capital stock. This, plus an accelerated increase in industrial growth, means that newly installed industrial plants and equipment will be significant additions to existing capital stock. Each new investment offers an opportunity to incorporate resource-efficient and less pollution-intensive technology.

64. In order to implement the objectives in chapter 19 of Agenda 21, national technological capacities have to be enhanced, especially in developing countries and economies in transition. For example, timely information exchange currently requires modern information technology, which, although costly, is efficient and, especially in emergency situations, can save many lives. The same applies for internationally accepted testing, which can only be done with modern equipment and apparatus, following accepted laboratory methods. Similarly, industrial processes that are designed to reduce the risk of exposure of workers and others in many instances also involve modern technology. The transfer of such modern technology to the developing countries is essential. National authorities responsible for chemical control have to be equipped to test chemicals and carry out other important tasks. Moreover, developing countries should promote legislation in areas such as labour safety and emission standards so that industry will be encouraged to use the best available technology when toxic chemicals are involved.

2. Finance

65. Income from the manufacture, trade and use of chemicals must be utilized to a greater extent to finance environmentally sound management. Although some income is already used for this purpose, additional fiscal measures should be considered to strengthen support work at the national and international levels.

66. In the pre-UNCED assessment of funding needs, the cost of sound management of chemicals in industrialized countries was calculated at 0.15 per cent of the value of the chemicals manufactured or imported. It was assumed that the same ratio would apply for developing countries - an estimated cost of $500,000,000-600,000,000. It was suggested that 20 per cent of that amount, or $100,000,000-150,000,000, be concessional finance provided by the international community to developing countries.

67. The costs and spending reported below reflect those of United Nations bodies and programmes in relation to the implementation of the different programme areas and do not include costs associated with research. It should be noted that analysis of the current funding situation is severely limited by the lack of a harmonized format for reporting financial data.

68. Agenda 21 estimates that some $30,000,000 per annum would be needed to meet the objective of accelerating the assessment of chemical risks so that by the year 2000 some 500 chemicals would be assessed and appropriate information on them disseminated. Currently, the United Nations system reports spending a total of some $10,000,000 on all aspects of international assessment of chemical risks. This does not include costs associated with research and data generation.

69. Agenda 21 estimates that about $3,000,000 per annum would be needed to strengthen the capacities of international organizations to coordinate the work of harmonization. Currently ILO, the only organization providing cost figures, spends less than $500,000 per annum in this programme area.

70. Agenda 21 estimates that $10,000,000 per annum would be required to implement a programme on information exchange. The current spending of United Nations organizations in this area is estimated to be $4,000,000.

71. There was no comprehensive estimate of costs made for the programme area on risk reduction during UNCED, and incomplete figures have been provided by the United Nations agencies. To train and strengthen emergency and poison control centres, it was estimated that some $4,000,000 per annum would be required. Current funding levels for international work in this field is approximately $1,800,000 per annum.

72. The figure for the programme area on strengthening management capacity is given above (para. 66) - 0.15 per cent of the value of the chemicals manufactured or imported. UNEP has reported that the current costs of its programme in this area total approximately $1,000,000 per annum.

73. No estimate is included in Agenda 21 for the implementation of a programme on the prevention of illegal traffic of toxic and dangerous products. The relevant budgets of the United Nations system for the 1994/95 biennium amount to about $750,000 per annum as a minimum.

74. The cost for providing the basic infrastructure for coordination within a strengthened and expanded IPCS is estimated to be approximately $600,000 per annum during 1994/95 and will be shared among the organizations agreeing to participate in the work.

75. IPCS has been responsible for preparing for the International Conference on Chemical Safety, where the first intergovernmental forum on chemical safety is expected to be established. The cost of preparing for and holding the Conference has been approximately $1,000,000, of which about one third has been provided by the United Nations system. It is estimated that a fully operational secretariat for the forum and its subsidiary bodies would cost approximately $1,000,000 per annum depending, inter alia, on the work proposed by the forum.

76. It is apparent from the above estimates that, with regard to required activities by the United Nations and other multilateral organizations, additional financial resources will be required in order to take action in the programme areas in chapter 19. The relevant organizations are seeking ways and means to minimize costs through enhanced collaboration and cooperation and more intensive involvement of national authorities and the private sector.

77. The financing of capacity-building and technology transfer, especially through training and education, is very important, but no estimate of requirements is available. Similarly, no estimate is available for the important task of reducing toxic emissions.

III. CONCLUSIONS AND PROPOSALS FOR ACTION

78. It is well established that chemicals are essential for national, regional and global development. There is also worldwide awareness that chemicals must be produced and used in a sustainable way - i.e., in a way which does not pose harm to human health and the environment and which safeguards natural resources from degradation. National authorities must evaluate the risks posed by chemicals and develop risk management strategies adapted to local circumstances, including broad-based approaches to reduce the risks from toxic chemicals, taking into account their entire life cycle. In most countries, national capabilities and capacities for the promotion of chemical safety need to be strengthened. In developing countries, extensive support is required, particularly from the international community.

79. A great deal of work has been accomplished by United Nations organizations and programmes and other agencies at the global, regional and national levels to encourage the environmentally sound management of chemicals. This work has been critical for assessing potential risks and assisting countries to manage the risks exposed.

80. To use scarce resources more effectively, international coordination and cooperation is seen as essential for the successful implementation of chapter 19 of Agenda 21. Consequently, proposals include enhanced international cooperation through a strengthened IPCS, involving not only WHO, ILO and UNEP but also FAO, UNIDO, OECD and EU, and an intergovernmental forum on chemical safety which would recommend concerted international strategies and foster understanding by Governments of issues related to the implementation of chapter 19.

A. Conclusions

81. New and innovative ways of producing internationally accepted assessments of a large number of chemicals have to be developed in order better to utilize national and international resources. Internationally harmonized approaches to conducting and reporting risk assessments are vital. Guidance for setting national limits for exposure to chemicals from different media and guideline ranges based on internationally accepted assessments are needed to assist national authorities taking decisions for the management of chemical risks.

82. Significant progress has been made with the technical work of developing a globally harmonized system for the classification of chemicals, but there is need to further strengthen coordination by involving all relevant international organizations. An international framework for translating the results of technical work on harmonization into an instrument or recommendations applicable legally at the national level needs to be developed through appropriate international consultations.

83. Continuous efforts are needed to strengthen international information exchange networks, to encourage the creation of national or regional chemical information centres, and to enhance the participation of developed and developing countries in the networks. United Nations bodies/programmes and other international organizations need to strengthen their efforts to ensure that the information available and methods for gaining access to it meet user requirements worldwide. Particular attention should be paid to the areas of risk assessment, cleaner and safer technologies, and chemical emergency preparedness and response.

84. In order to protect human health and the environment from exposure to hazardous chemicals, United Nations bodies and programmes should continue to assist countries in the implementation and enforcement of the Prior Informed Consent (PIC) procedure for banned and severely restricted chemicals and encourage implementation of the ILO conventions on chemicals and major industrial accidents at the national level. Although risk reduction activities are primarily national in nature, all relevant United Nations organizations and programmes, intergovernmental bodies and the private sector should actively participate in PIC through information exchange and capacity-building activities. There is also a need to strengthen efforts to assist countries to implement relevant conventions and recommendations of United Nations bodies. The United Nations and other international organizations should facilitate immediate action in developing countries to reduce specific risks that are both readily identifiable and controllable, especially where significant benefits can be achieved at relatively small cost. United Nations bodies and programmes and other international organizations should continue their support of specific risk-reduction initiatives, particularly registers on the release and transfer of pollutants, pesticide safety and the development of safer substitutes. There is also a need for these organizations to assist at the national level in the implementation of internationally agreed systems concerning the prevention of response to major industrial accidents and response to those that occur and in the establishment of poison control centres.

85. United Nations bodies and other international organizations, with the support from countries with advanced chemical management systems, should give highest priority to the strengthening of national capabilities to manage chemicals safely via, for example, national and regional training. They should also assist countries to prepare national profiles indicating their capabilities and capacities for the management of chemicals and support the development of appropriate strategies to implement and enforce chemical risk management measures. There is a clear need to improve the coordination of education, training and technical assistance activities among international bodies, national Governments and non-governmental organizations.

86. There is an urgent need to increase international efforts to assist countries in the development and enforcement of legislation to control the illegal movement of toxic chemicals. Furthermore, appropriate international legal instruments, including one on the mandatory application of the PIC procedure, need to be elaborated and eventually adopted.

87. Involvement in and support of international initiatives by the non-governmental organization community, including research institutes and centres, need to be encouraged in order to make the best use of human resources for addressing key issues.

88. In addition, in order to more effectively use scarce resources, enhanced international coordination and cooperation is seen as essential for the successful implementation of chapter 19 of Agenda 21.

B. Proposals for action

89. The following proposals reflect the increased effort and support necessary for the effective implementation of chapter 19. Particular attention is paid to ways of supporting the role played by the United Nations system.

1. Need for sustainable development

90. To achieve sustainable development, Governments must ensure that chemicals are used and managed in a sustainable way - i.e., one that does not pose harm to human health or the environment and that safeguards natural resources, taking local circumstances into account.

91. In order to finance environmentally sound management of chemicals, countries should be urged to develop appropriate economic instruments - e.g., taxes or levies - to strengthen the management of chemicals throughout their life cycle. Increased finance raised nationally would enable countries to make a greater contribution to international activities and to enhance international cooperation in this field. Governments should, furthermore, provide industry with economic incentives for undertaking environmentally sound management of chemicals.

2. Capacity-building

92. International and national organizations should give higher priority to capacity-building and improving coordination among different agencies and programmes for the successful implementation of chapter 19 at the national level.

93. Governments, with the assistance of relevant international organizations and programmes, should develop national profiles to indicate the current capabilities and capacities for the management of chemicals, the need for chemical legislation and enforcement, and education, training and technical assistance. Countries with more advanced chemical management systems should

provide information, training and technical assistance to other countries for the development of infrastructure and capacity to manage chemicals safely.

94. Governments should be encouraged to introduce measures to reduce risks that are both readily identifiable and readily controllable, as a first immediate step.

95. Countries with more advanced chemical management systems should consider ways of facilitating the transfer of cleaner and safer technology to less developed countries, bearing in mind the difficulties posed by the limited financial means of developing countries to gain access to such technology.

3. Coordination and cooperation

96. Increased coordination of United Nations bodies and other international organizations involved in chemical assessment and management is needed in order to improve and enhance international cooperation and avoid unnecessary duplication of effort. All steps should be taken to facilitate the active participation of all major players on the international chemicals stage in a strengthened IPCS to share the burden of work.

97. There is an urgent need further to develop and implement concerted international strategies for chemical risk assessment and management in all countries. Governments should therefore strongly support all efforts to strengthen international cooperation on chemicals and the establishment of the an intergovernmental forum on chemical safety.

98. International organizations should be urged to strengthen harmonization of procedures and approaches for risk assessment, information exchange and risk management, including harmonization of terminology.

99. Further efforts are required at the national and international levels to ensure compatibility and comparability of data collection, processing and information exchange, since the validity of assessments depends on the quality of the information used.

100. Risk assessment is highly demanding of scientific resources and in order to meet the goals of chapter 19 there is need to join forces and increase the scientific contribution from countries to the international arena for accelerated assessments of risks and better interpretations of data. There is also need to understand better the mechanisms of toxicity and to develop and validate toxicity tests that reduce the use of vertebrate animals.

101. The technical work coordinated by the United Nations system, which underpins the harmonization and compatibility of classification and labelling, needs additional support from countries in order to meet the chapter 19 goals.

102. In the area of information exchange, there is need for increased data contributions from national sources into international data banks - e.g., the UNEP IRPTC.

103. As part of a longer-term objective in the area of risk reduction, there is need for promotion, at both the national and international levels, of the development of safer technologies and processes and for safer substitutes for harmful chemicals.

104. Since industry is a major player in furthering the objectives of chapter 19 - in particular with respect to risk assessment, including the generation and provision of data and the adoption and implementation of risk reduction measures - it should be encouraged to adopt a code of ethics on international trade in chemicals such as the one that has been developed under the auspices of UNEP.

4. Awareness of the general public

105. Efforts should be made at the national and international levels to ensure that the general public, and especially people at work, understand the meaning of labels and other ways of communicating risks and risk management measures.

106. International organizations should make the best use of active participation by the non-governmental organizations concerned with chemical risks posed to health and the environment, including unions and consumer groups. Such non-governmental organizations could contribute to information exchange and a wider understanding of harmonized classification and labelling.

5. Development of national legislation and implementation of instruments of the United Nations system

107. Greater national attention should be given to strengthening the enforcement of national legislation in order more to effectively control chemical risks. Chemical legislation needs to be strengthened in all countries, particularly in developing countries undergoing rapid industrialization. Legislative guidance should urgently be provided to such countries.

108. To increase their effectiveness, legal and other instruments developed under the auspices of the United Nations system need to be more widely ratified and/or implemented at the national level. Wider implementation is particularly important for risk management/reduction initiatives and for the PIC procedure. To prevent illegal traffic in toxic and dangerous products, international legal instruments, including one on the mandatory application of the PIC procedure, should be elaborated and eventually adopted.

6. Effectiveness indicators

109. It is important for the international community to set goals against which progress in the different programme areas can be measured. In preparation for a longer-term objective, it is also important to start considering ways of assessing cost-effectiveness in various programme areas and particular risk management undertakings and asking whether initiatives meet user needs.

Notes

1/ Rune Lonngren, International Approaches to Chemicals Control: A Historical Overview (Stockholm, National Chemicals Inspectorate, 1992).

2/ Industry and Development, Global Report, 1993/94 (United Nations publication, Sales No. E.93.III.E.4).

3/ Sweden, Ministry of the Environment and Natural Resources, Hazardous Goods (Stockholm, 1992).

4/ Report of Conference on Industry, the Environment and Human Health: In Search of a Harmonious Relationship, Minamata, Japan, 13-16 November 1991 (Tokyo, United Nations University, 1992).